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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

Dec. 3, 1982. GERALD J. MOSSINGHOFF, *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,282,287, Re. S.N. 532,037, Filed Sept. 14, 1983, Cl. 428/437, BIOCHEMICAL AVIDIN-BIOTIN MULTIPLE-LAYER SYSTEM, Roger W. Giese, Owner of Record: *Inventor,* Attorney or Agent: Richard P. Crowley, Ex. Gp.: 164

4,286,671, Re. S.N. 528,267, Filed Aug. 31, 1983, Cl. 172/253, KIT FOR CONVERTING A ROTARY TILLER INTO A PLOW, James A. Mays, Owner of Record: *Inventor,* Attorney or Agent: Frank E. Robbins, et al., Ex. Gp.: 334

4,287,948, Re. S.N. 529,061, Filed Sept. 2, 1983, Cl. 166/170, TUBULAR MEMBER INTERIOR WIPER, Archie K. Haggard, Owner of Record: *Inventor,* Attorney or Agent: James F. Weiler, et al., Ex. Gp.: 356

4,357,268, Re. S.N. 530,805, Filed Sept. 9, 1983, Cl. 524/285, NUCLEATION AGENTS FOR CRYSTALLINE POLYMERS, Nicholas Vanderkooi, Jr., et al., Owner of Record: *Allied Chemical Corp., Morris Township, N.J.,* Attorney or Agent: Richard A. Negin, Ex. Gp.: 142

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,168,315, Reexam. No. 90/000,466, Requested: Nov. 7, 1983, Cl. 424/276, DIANISYL THIAZOLE COMPOUND, COMPOSITIONS AND METHOD OF ANTITHROMBOTIC TREATMENT, Ronald H. Rynbrandt, et al., Owner of Record: *Upjohn Co., Kalamazoo, Mich.,* Attorney or Agent: John Killinger, Ex. Gp.: 125, Requester: Upjohn Co., Kalamazoo, Mich.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,891,375, Vandamme and Rouyer, APPARATUS FOR THE PRODUCTION OF HIGH BULK YARN; **3,165,881,** de Moncuit and Crouzet, PRODUCTION OF HIGH BULK YARNS; **3,232,037,** Henri Crouzet, FALSE-TWIST SPINDLE; **3,584,450,** Henri Crouzet, PROCESS AND DEVICE FOR THE MANUFACTURE OF TEXTURED YARNS, **filed** Feb. 1, 1977, D.C., M.D.N.C. (Greensboro), Doc. C-77-47-G, *Milliken Research Corp., et al.* v. *Collins & Aikman Corp.* Stipulation and Order of Dismissal that complaint and counterclaim are dismissed with prejudice filed Jan. 21, 1980.

2,891,375, Vandamme and Rouyer, APPARATUS FOR THE PRODUCTION OF HIGH BULK YARN; **3,012,397,** Henri Servage, METHOD OF MAKING HIGH-BULK YARNS; **3,165,881,** de Moncuit and Crouzet, PRODUCTION OF HIGH BULK YARNS; **3,232,037,** Henri Crouzet, FALSE-TWIST SPINDLE; **3,584,450,** Henri Crouzet, PROCESS AND DEVICE FOR THE MANUFACTURE OF TEXTURED YARNS, **filed** Oct. 15, 1976, D.C., M.D.N.C. (Greensboro), Doc. C-76-550-G, *Deering Milliken Research Corp., et al.* v. *Sapona Mfg. Co., Inc.* Stipulation of Dismissal that complaint and counterclaim be dismissed with prejudice filed July 31, 1980.

3,012,397. (See 2,891,375.)

3,098,210, Smiths Industries Ltd., ECHO RANGING AND LIKE SYSTEMS, **filed** Dec. 11, 1978, D.C., S.D.N.Y., Doc. 78-Civ-5940 RJW, *Smiths Industries Ltd.* v. *Simrad A.S.* **Same, filed** Nov. 7, 1979, D.C., M.D. Fla. (Tampa), Doc. 79-1150-Civ-T-GC, *Smiths Industries Ltd.* v. *KGS Marine, Inc.* **Same, filed** Nov. 19, 1979, D.C., E.D. Calif. (Sacramento), Doc. S 79-875 PCW, *Smiths Industries Ltd.* v. *BayMar.* **Same, filed** Nov. 19, 1979, D.C., S.D. Fla. (Miami), Doc. 79-5420-CIV-EBD, *Smiths Industries Ltd.* v. *Southern Marine Research, Inc.*

3,153,436, Mary Jane Schmidt, SPIRAL MEAT SLICER, **filed** June 1, 1979, D.C. Colo. (Denver), Doc. 79-C-646, *Mary Jane Schmidt* v. *Hickory Baked Ham Co.* Stipulated Judgment dismissing claims and counterclaims filed Oct. 30, 1979.

3,165,881. (See 2,891,375.)

3,190,973, Gentex Corp., RIGID SHELL HELMET AND RIGGING AND SOUND ATTENUATING MEANS THEREFOR; **3,241,154, same,** SAFETY

HELMETS; **3,470,564, same,** SAFETY HELMET WITH SOUND ATTENUATING EARCUPS, **filed** July 31, 1981, D.C., E.D. Pa. (Philadelphia), Doc. 81-3077, *Gentex Corp.* v. *Intamar Logistics, Inc.*

3,226,833, Jerome H. Lemelson, AUTOMATIC INSPECTION APPARATUS AND METHOD; **3,636,635, same,** AUTOMATIC MEASUREMENT APPARATUS; **3,481,042, same,** SURFACE SENSING APPARATUS, **filed** Apr. 20, 1983, D.C. Del. (Wilmington), Doc. 83-220, *Intertech Licensing Corp.* v. *Brown & Sharpe Mfg. Co.* **Same, filed** Apr. 20, 1983, D.C. Del. (Wilmington), Doc. 83-221, *Intertech Licensing Corp.* v. *The Bendix Corp.* **Same, filed** Apr. 20, 1983, D.C. Del. (Wilmington), Doc. 83-222, *Intertech Licensing Corp.* v. *E. Leitz, Inc.*

3,232,037. (See 2,891,375.)

3,241,154, Gentex Corp., SAFETY HELMETS; **3,470,564, same,** SAFETY HELMET WITH SOUND ATTENUATING EARCUPS, **3,619,814, same,** PROTECTIVE HELMET WITH ADJUSTABLE HEADBAND, **filed** Jan. 14, 1980, D.C., E.D. Pa. (Philadelphia), Doc. 80-0195, *Gentex Corp.* v. *Emge Aviation-Marine Products, Inc.* Plaintiff's Patent Nos. 3,241,154, 3,470,564 and 3,619,814 are valid and have been infringed by defendant. Defendant is permanently enjoined and restrained from further infringing Plaintiff's patents. Filed Mar. 24, 1981.

3,241,154. (See 3,190,973.)

3,247,969, Fiestaglass Pool Products, Inc., SWIMMING POOL, **filed** Dec. 31, 1979, D.C. Ariz. (Phoenix), Doc. 79-1048 PHX, *Fiestaglass Pool Products, Inc., et al.* v. *Paddock Pool Construction Co., et al.*

3,267,934, William E. Thornton, ELECTRO-CARDIAC COMPUTER, **filed** Feb. 6, 1979, D.C. Colo. (Denver), Doc. 79-F-120, *Del Mar Avionics* v. *International Medical Corp.* Order for Dismissal filed Dec. 10, 1979.

3,311,990, Donald E. Wright, LEVEL, **filed** Jan. 2, 1980, D.C., N.D. Ill. (Chicago), Doc. 80C0004, *Empire Level Mfg. Corp.* v. *Cotter & Co., Inc.*

3,317,994, Southwire Co., METHOD OF CONDITIONING METAL FOR HOT FORMING; **3,623,532, same,** CONTINUOUS PICKLING OF CAST ROD; **3,672,430, same,** METHOD OF PRODUCING A HOT-FORMED COPPER-BASE PRODUCT; **3,716,423, same,** HOT-FORMED COPPER-BASE PRODUCT; **4,129,170, same,** APPARATUS FOR PRODUCING A HOT-FORMED PRODUCT, **filed** Aug. 9, 1979, D.C., N.D. Tex. (Amarillo), Doc. CA-2-79-131, *Asarco, Inc.* v. *Southwire Co.* Complaint and action dismissed without prejudice on Mar. 10, 1980.

3,355,714, Hewlett-Packard Co., ON-LINE COMPUTING SYSTEM FOR PROCESSING MATHEMATICAL FUNCTIONS; **3,523,282, same,** CALCULATOR; **3,825,736, same,** CALCULATOR WITH PROVISION FOR EFFICIENTLY MANIPULATING FACTORS AND TERMS, **filed** Dec. 21, 1979, D.C., S.D.N.Y., Doc. 79-Civ-6932, *Hewlett-Packard Co.* v. *Unisonic Products Corp.*

3,414,254, Norfin, Inc., SHEET COLLATING DEVICE, **filed** Feb. 15, 1979, D.C. Colo. (Denver), Doc. 79-F-158, *International Business Machines Corp.* v. *Norfin, Inc.* Order for Dismissal with prejudice filed Nov. 27, 1979.

3,442,692, The Proctor & Gamble Co., METHOD OF CONDITIONING FABRICS; **3,686,025, same,** TEXTILE SOFTENING AGENTS IMPREGNATED INTO ABSORBENT MATERIALS; **3,743,534, same,** PROCESS FOR SOFTENING FABRICS IN A DRYER; **3,944,694, same,** ARTICLE FOR CONDITIONING FABRICS IN A CLOTHES DRYER; **3,956,556, same,** ARTICLE FOR CONDITIONING FABRICS IN A CLOTHES DRYER, **filed** Oct. 4, 1977, D.C., N.D. Ohio (Toledo), Doc. C77-520, *Papercraft Corp., et al.* v. *The Proctor & Gamble Co.* Plaintiff is permanently enjoined and restrained from further infringing Defendant's patents per Consent Judgment filed Feb. 27, 1978.

3,464,568, Peter K. Hexter, TOWEL BAR CONSTRUCTION, **filed** Jan. 25, 1980, D.C.N.J. (Newark), Doc. 80-225, *Peter K. Hexter and Lanape Products, Inc.* v. *Melard Mfg. Corp.* Order of dismissal of action filed Oct. 28, 1980.

3,470,564. (See 3,190,973 and 3,241,154.)

3,476,898, Unimax Switch Corp., PIVOT FOR SNAP-ACTING SWITCH, **filed** Jan. 11, 1980, D.C., N.D. Ill. (Chicago), Doc. 80 C 169, *Unimax Switch Corp.* v. *Otto Engineering, Inc.* Cause dismissed with prejudice and without costs per Stipulation and Order dated Aug. 27, 1980.

3,481,042. (See 3,226,833.)

3,523,282. (See 3,355,714.)

3,584,450. (See 2,891,375.)

3,599,038, Nordson Corp., APPARATUS AND SYSTEMS FOR HIGH-VOLTAGE ELECTROSTATIC CHARGING OF PARTICLES; **3,731,145, same,** ELECTROSTATIC SPRAY GUN WITH SELF-CONTAINED MINIATURIZED POWER PACK INTEGRAL THEREWITH, **filed** Apr. 20, 1978, D.C., N.D. Ohio (Toledo), Doc. C 78-337, *Gema A. G. Apparatebau* v. *Nordson Corp.* **Same, filed** Apr. 20, 1978, D.C.N.J. (Newark), Doc. 78-835, *Gema A.G. Apparatebau* v. *Nordson Corp.*

3,619,814. (See 3,241,154.)

3,623,532. (See 3,317,994.)

3,636,635. (See 3,226,833.)

3,672,430. (See 3,317,994.)

3,686,025. (See 3,442,692.)

3,716,423. (See 3,317,994.)

3,731,145. (See 3,599,038.)

3,743,534. (See 3,442,692.)

3,746,608, Mitsuhiro Takahashi, SHAPED ARTICLE OF SYNTHETIC RESIN HAVING MECHANICALLY DISORDERED ORIENTATION, **filed** Aug. 7, 1978, D.C., N.D. Ohio (Cleveland), Doc. C-78-977, *Weld-Loc Systems, Inc.* v. *Pak-Tron, Inc.* **Same, filed** Aug. 9, 1978, D.C., E.D. Va. (Norfolk), Doc. 78-377-N, *Weld-Loc Systems, Inc.* v. *Dynaric, Inc.* **Same, filed** Apr. 4, 1979, D.C., N.D. Ill. (Chicago), Doc. 79 C 1527, *Weld-Lock Systems, Inc.* v. *Wilton Corp.*

3,783,083, Monarch Marking Systems, Inc., COMPOSITE WEB OF PRESSURE SENSITIVE LABELS; **3,852,139, same,** METHOD OF DISPENSING LABELS; **3,948,172, same,** LABEL PRINTING AND APPLYING APPARATUS; **3,957,562, same,** APPARATUS FOR PRINTING AND APPLYING PRESSURE SENSITIVE LABELS, **filed** Sept. 8, 1976, D.C., N.D. Ill. (Chicago), Doc. 76 C 3345, *Monarch Marking Systems, Inc.* v. *Consolidated Food Corp.*

3,825,736. (See 3,355,714.)

3,838,241, CS&M, Inc., MATRIX FABRICATION, **filed** Jan. 2, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 79 05028, *Covington Brothers Technologies* v. *CS&M, Inc.*

3,852,139. (See 3,783,083.)

3,853,122, Strauch and Bloomberg, METHOD AND DEVICE FOR ACHIEVING A PENILE ERECTION, **filed** Dec. 7, 1979, D.C. Minn. (St. Paul), Doc. 3-79-608, *Selwyn Z. Freed* v. *American Medical Systems, Inc.*

3,944,694. (See 3,442,692.)

3,948,172. (See 3,783,083.)

3,956,556. (See 3,442,692.)

3,957,562. (See 3,783,083.)

4,009,265, Alan N. Howard, METHODS AND FORMULATIONS FOR THE TREATMENT OF OBESITY; **4,298,601, same,** METHOD AND FORMULATIONS FOR THE TREATMENT OF OBESITY, **filed** June 7, 1983, D.C., E.D. Pa. (Philadelphia), Doc. 83-2693, *Cambridge Plan International* v. *Optibal Co., et al.*

4,035,109, Drath & Schlosser, PUMP FOR FLUENT, AND ESPECIALLY HEAVY AND ABRASIVE MATERIALS, **filed** May 9, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-2979, *Graco, Inc.* v. *Binks Mfg. Corp.*

4,040,806, Kenneth B. Kennedy, PROCESS FOR PURIFYING HYDROCARBON GAS STREAMS, **filed** Aug. 15, 1979, D.C. New Mexico (Albuquerque), Doc. 79-652 JB, *K.B. Kennedy Engineering Co., Inc.* v. *Southwestern Public Service Co.* Order filed Feb. 6, 1980.

4,045,176, Proksch and Bonderman, PREPARATION OF OPTICALLY CLEAR SERUM, **filed** Apr. 20, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 2736, *Analytical Controls and American Hospital Supply Corp.* v. *Fisher Scientific Co., Inc.*

4,066,423, McGill and Scott, ADSORPTION-ABSORPTION VAPOR RECOVERY SYSTEM, **filed** Jan. 9, 1980, D.C., N.D. Okla. (Tulsa), Doc. 80-C-17-E, *McGill, Inc.* v. *John Zink Co.* Defendant Zink is enjoined from further infringement of claim 2 of the McGill Patent, letters patent no. 4,066,423. Defendant is further enjoined from inducing infringement and contributing to infringement by its customers, of claim 2 of letters patent no. 4,066,423. Filed June 22, 1983.

4,077,328, Glenn Taylor, ROTARY DUMP, **filed** July 28, 1983, D.C., N.D. Ga. (Atlanta), Doc. C83-1595, *Bankhead Enterprises, Inc.* v. *Diversified Metal Fabricators, Inc., et al.*

4,123,315, William A. Nickerson & Co., Ltd., MACHINE FOR ASSEMBLING WOOD I-BEAMS, **filed** June 28, 1983, D.C. Ore. (Portland), Doc. 83-986, *David R. Davidson* v. *Columbia Pacific Structural Components, Inc.*

4,129,170. (See 3,317,994.)

4,136,359, Apple Computer, Inc., MICROCOMPUTER FOR USE WITH VIDEO DISPLAY; **4,278,972, same,** DIGITALLY-CONTROLLED COLOR SIGNAL GENERATION MEANS FOR USE WITH DISPLAY, **filed** May 17, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 3212, *Apple Computer, Inc.* v. *Jade Computer Products, Inc.* **Same, filed** May 17, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 3213, *Apple Computer, Inc.* v. *Michael P. McCaul and Sheila Ann McCaul, doing business as Cosmic Computers, Unlimited.* **Same, filed** May 17, 1983, D.C., C.D. Calif. (Los Angeles), Doc. 83 3214, *Apple Computer, Inc.* v. *Ironsides Computer Corp., et al.*

4,183,057, ACS Hospital Systems, Inc., ACTUATING SYSTEM FOR A RENTAL TELEVISION, **filed** May 13, 1981, D.C., W.D. Pa. (Pittsburgh), Doc. 81-787 *ACS Hospital Systems, Inc.* v. *Montefiore Hospital.* Judgment is rendered for the Defendant per Order filed May 25, 1983.

4,186,877, Wilcox and Conrad, BY-PASS NOZZLES, **filed** July 14, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 4825, *Delavan Corp.* v. *Spraying Systems Co.*

4,233,661, Bolton and Dallen, COMPUTER CONTROLLED REGISTRATION AND INQUIRY SYSTEM, **filed** May 23, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 3516, *Registration Control Systems, Inc.* v. *Compusystems, Inc.*

4,278,972 (See 4,136,359.)

4,296,580, Roger Neil Weinar, WALL CONSTRUCTED FROM PANELS HELD IN POSITION WITH THE AID OF CONCEALED FASTENERS AND CONCEALABLE FASTENERS FOR USE IN ASSEMBLING SUCH WALL, **filed** Oct. 28, 1981, D.C., E.D. Mich. (Ann Arbor), Doc. 81-73995, *National Gypsum Co.* v. *Rollform, Inc.* U.S. Pat. No. 4,296,580 is invalid per Judgment filed May 20, 1983.

4,298,601, Alan N. Howard, METHOD AND FORMULATIONS FOR THE TREATMENT OF OBESITY, **filed** Feb. 2, 1983, D.C. S.D. Calif. (San Diego), Doc. 83-0278-JLI(I), *Cambridge Plan International* v. *Ultra Drug Co.* Defendant is hereby enjoined and restrained from further infringing U.S. Pat. No. 4,298,601 per Consent Decree entered June 6, 1983. **Same, filed** June 9, 1983, D.C., W.D.N.Y. (Buffalo), Doc. 83-628C, *Cambridge Plan International* v. *Republic Drug Co.* **Same, filed** Dec. 27, 1982, D.C., C.D. Calif. (Los Angeles), Doc. 82 6763, *Cambridge Plan International* v. *Leo Daboub.* Stipulation and Order for dismissal with prejudice and without costs entered June 10, 1983. **Same, filed** July 7, 1983, D.C., E.D. Mich. (Detroit), Doc. 83-2703, *Cambridge Plan International* v. *O'Conner Products Co.*

4,298,601. (See 4,009,265.)

4,313,861, Union Carbide Corp., LATEX AUTODEPOSITION COATINGS, **filed** Feb. 2, 1983, D.C., S.D. W. Va. (Charleston), Doc. 83-2103, *Amchem Products, Inc.* v. *Union Carbide Corp., et al.* Stipulation of Dismissal with prejudice by plaintiff filed June 29, 1983.

4,366,143, Midgley and Wilkins, ASSAY FOR THE FREE PORTION OF SUBSTANCES IN BIOLOGICAL FLUIDS, **filed** Jan. 3, 1983, D.C., N.D. Ill. (Chicago), Doc. 83 C 0016, *Amersham International PLC* v. *Travenol Laboratories, Inc.* Stipulated Order of Dismissal without prejudice as to all defendants entered May 11, 1983.

4,377,195, Jack Weil, PRIVATE CUBICLE ENCLOSURE, **filed** Aug. 3, 1983, D.C., S.D.N.Y., Doc. 83-Civ-5739, *Indecor, Inc.* v. *Fox-Wells & Co., Inc.*

4,381,871, Dopyera and Miller, SWIVEL COUPLING ELEMENT, **filed** June 20, 1983, D.C., S.D. Tex. (Houston), Doc. H-83-3878, *Big Inch Marine Systems, Inc.* v. *Gripper, Inc., et al.*

4,383,286, Roy T. Hicks, COOLING AND POWER INPUT ASSEMBLY, **filed** Aug. 4, 1983, D.C., S.D.N.Y., Doc. 83-Civ-5794 CES, *Kensington Microware, Ltd.* v. *Roy T. Hicks.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Dec. 30, 1983:

Adams, Thomas, Northern Telecom Ltd., Patent Dept., P.O. Box 3511, Station C, Ottawa, Ont., Canada K1Y 4H7

Jones, Philip W., Gowling & Henderson, 160 Elgin St., Ottawa, Ont., Canada K1N 8S3

Lake, James R., Ridout & Maybee, 2300 Richmond-Adelaide Centre, 101 Richmond St. West, Toronto, Canada M5H 2J7

Schmitkons, George E., 4511 Simmons La., Temple Hill, Md. 20748

Sharp, William R., 705 Holly Tree La., Waldorf, Md. 20601

Sinnott, Timothy J., Barrigar & Oyen, Suite 700, The National Bldg., 130 Slater St., Ottawa, Canada K1P 6E2

Vernon, Robert E., DuPont Canada, Inc., Box 2200, Streetville, Mississauga, Ont., Canada L5M 2H3

WILLIAM FELDMAN,
Director, Office of
Enrollment and Discipline.

PATENT NOTICES

Certificates of Correction for the Week of Dec. 6, 1983

D. 268,330	4,371,741	4,391,781	4,402,267
D. 270,049	4,374,926	4,391,966	4,402,747
Re. 31,312	4,377,915	4,392,066	4,403,380
4,040,825	4,378,097	4,393,112	4,403,435
4,201,648	4,379,434	4,393,883	4,403,496
4,240,909	4,379,882	4,394,478	4,403,729
4,256,894	4,380,640	4,394,589	4,404,140
4,318,853	4,382,025	4,395,268	4,404,925
4,320,658	4,383,332	4,395,274	4,404,999
4,322,220	4,383,353	4,396,404	4,405,191
4,331,566	4,385,016	4,396,490	4,405,287
4,334,780	4,385,682	4,396,615	4,405,375
4,343,794	4,385,829	4,396,760	4,405,522
4,348,550	4,385,950	4,396,872	4,405,864
4,356,506	4,386,119	4,397,554	4,406,521
4,356,634	4,387,380	4,398,104	4,406,870
4,359,634	4,387,597	4,398,583	4,407,066
4,362,054	4,387,618	4,398,733	4,407,233
4,363,424	4,388,358	4,398,915	4,407,331
4,363,487	4,388,834	4,399,243	4,407,343
4,365,323	4,389,084	4,399,432	4,407,433
4,365,357	4,389,125	4,400,308	4,408,030
4,367,541	4,389,787	4,400,939	4,408,542
4,368,345	4,390,986	4,401,253	4,409,085
4,370,094	4,391,483	4,401,691	4,410,294

Disclaimer

4,228,741.—*Frank D. Bruner,* Omaha, Nebr. AUTOMATICALLY RELEASING STABILIZER. Patent dated Oct. 21, 1980. Disclaimer filed Sept. 14, 1983, by the assignee, *Paxton & Vierling Steel Co.*

Hereby enters this disclaimer to claim 15 of said patent.

Dedication

4,196,723.—*Lawrence A. Moose, Jr.,* Memphis, Tenn. DUAL FENESTRATED SURGICAL DRAPE WITH A FLAP CAPABLE OF COVERING AND ISOLATING EITHER FENESTRATION. Patent dated Apr. 8, 1980. Dedication filed Oct. 17, 1983, by the assignee, *The Buckeye Cellulose Corp.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimer and Dedication

4,247,045.—*Wayne R. Mitchell,* Muncy and *Kenneth Wands,* Riverside, Pa. AUTOMATIC VOLUME CONTROL SYSTEM. Patent dated Jan. 27, 1981. Disclaimer and Dedication filed Sept. 1, 1983, by the assignee, *Redland Prismo Corp.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

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Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

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Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
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Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
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Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispe[illegible] Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assort[illegible] Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

DECEMBER 6, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 28,576 (147th)

PROCESS FOR RAPID DISSOLVING WATER-SOLUBLE VINYL ADDITION POLYMERS USING WATER-IN-OIL EMULSIONS

Donald R. Anderson, Oswego, and Alvin J. Frisque, La Grange, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Reexamination Request No. 90/000,246, Aug. 25, 1982.

Reexamination Certificate for Reissue Patent Re. 28,576, issued Oct. 21, 1975, Ser. No. 413,848, Nov. 9, 1973.

Original No. 3,734,873, dated May 22, 1973, Ser. No. 278,329, Aug. 7, 1972. Continuation of Ser. No. 172,946, Aug. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 92,031, Dec. 15, 1970, Pat. No. 3,624,019.

Int. Cl.[3] **C08J** *3/06*

U.S. Cl. 523—336

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **7, 10, 11,** and **22–27** is confirmed.

Claims **2, 3, 5, 9, 15–17** and **20,** having been finally determined to be unpatentable, are cancelled.

Claims **1, 4, 6, 8, 14** and **19** are determined to be patentable as amended:

Claims **12, 13, 18, 21, 28,** and **29,** dependent on amended claims, are determined to be patentable.

New claims **30–39** are added and determined to be patentable.

1. A method of rapidly dissolving water-soluble vinyl addition polymers into water, which comprises the steps of:

(A) preparing a water-in-oil emulsion which contains dispersed therein from 5 to 75 percent by weight of finely-divided water-soluble vinyl addition polymer; said emulsion *containing an oil-soluble emulsifying agent and* having *during such preparation of said emulsion* an oil-to-water ratio between 5:1–1:10, and said oil being a hydrocarbon liquid; and then,

(B) inverting said *polymer-containing* emulsion in water *in the presence of a water soluble-surfactant* whereby the water-soluble vinyl addition polymer is released into the water as a solution.

B1 3,237,132 (145th)

DIELECTRIC MICROWAVE RESONATOR

Akira Okaya, Leonia, N.J., assignor to Patlex Corp., Westfield, N.J.

Reexamination Request No. 90/000,330, Feb. 18, 1983.

Reexamination Certificate for Patent No. 3,237,132, issued Feb. 22, 1966, Ser. No. 3,872, Jan. 21, 1960.

Int. Cl.[3] **H01P** *1/207, 7/10*

U.S. Cl. 333—211

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

1. Microwave apparatus for operation at a predetermined frequency including a wave guide to which microwaves are supplied, a dielectric resonator located in the wave guide intermediate the ends of the wave guide, the cross section of the wave guide being substantially unobstructed upstream of the resonator, said dielectric resonator being a solid piece of material having a particular natural frequency of dielectric resonance the effective coupling of the solid piece being dependent upon the orientation of the resonator with respect to the microwaves, but which is not dependent on piezoelectric characteristics and which is also independent of the size and shape of the wave guide and resonating at that frequency to reflect or absorb, depending upon the modes of the microwaves and frequency of the dielectric resonator, the microwave frequency corresponding to said resonator frequency, the material of the resonator having a power factor less than 0.005 and a dielectric constant greater than 5, and the mode inside the resonator being unique by having a configuration which corresponds selectively to the TE or TM mode.

B1 3,434,165 (143rd)

HOSPITAL BED

Francis X. Keane, Dublin, Ireland, assignor to Kincoa, Ltd., Chicago, Ill.

Reexamination Request No. 90/000,219, Jun. 17, 1982.

Reexamination Certificate for Patent No. 3,434,165, issued Mar. 25, 1969, Ser. No. 650,984, Jul. 3, 1967.

Int. Cl.[3] **A61G** *7/00, 7/06;* **A61F** *5/37*

U.S. Cl. 5—61

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **15** is confirmed.

Claims **6–14,** having been finally determined to be unpatentable, are cancelled.

Claims **1, 16,** and **17** are determined to be patentable as amended:

Claims **2–5,** dependent on amended claims, are determined to be patentable.

New claims **18–102** are added and determined to be patentable.

1. A bed comprising:

a bed support means, a patient supporting portion mounted on the bed support means, a substantially U-shaped keel holding the patient supporting portion, and a pivot means connecting the keel and the bed support means for controlled oscillatory movement of the patient supporting

portion relative to the bed support means about a central longitudinal axis of oscillation, the oscillation axis extending above the center of gravity *of the U-shaped keel and patient supporting portion* of the bed and any patient positioned on the patient supporting portion.

B1 3,597,549 (146th)

HIGH SPEED DATA COMMUNICATION SYSTEM

Wayne D. Farmer, Madison Township, Middlesex County, and Edmunde E. Newhall, Rumson, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Reexamination Request No. 90/000,242, Aug. 11, 1982.
Reexamination Certificate for Patent No. 3,597,549, issued Aug. 3, 1971, Ser. No. 842,581, Jul. 17, 1969.
Int. Cl.[3] **H04J** *3/08*
U.S. Cl. 370—88

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–19** is confirmed.

New claims **20–28** are added and determined to be patentable.

1. In combination,

a closed transmission loop and plural stations coupled thereto for transmitting information signals and operation codes among such stations,

means in each said station responsive to a predetermined one of said codes on said loop to initiate station transmission on to said loop, and

means inserting said predetermined code as the final portion of such transmission.

B1 3,982,419 (144th)

APPARATUS FOR AND METHOD OF DETERMINING ROTATIONAL AND LINEAR STIFFNESS

John T. Boys, Christ Church, New Zealand, assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Reexamination Request No. 90/000,256, Sep. 13, 1982.
Reexamination Certificate for Patent No. 3,982,419, issued Sep. 28, 1976, Ser. No. 507,417, Sep. 19, 1974.
Continuation-in-part of Ser. No. 357,920, May 7, 1983, abandoned.
Claims priority, application United Kingdom, May 9, 1972, 21480/72
Int. Cl.[3] **B25B** *23/14;* **B23P** *19/06;* **G01D** *1/10, 1/16*
U.S. Cl. 73—862.24

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–39, 42–82,** and **85–88** is confirmed.

Claims **40, 83,** and **89** are determined to be patentable as amended:

Claims **41** and **84**, dependent on amended claims, are determined to be patentable.

83. Apparatus for sensing a desired point on a curve representing the variation of two related inputs, generated by an external source, wherein said related inputs are torque and rotation imparted to a threaded fastener, said curve is the torque-rotation curve through which the fastener is being tightened, and wherein said curve has a generally linear portion and said desired point lies beyond said generally linear portion, said apparatus comprising:

first means for developing a signal representative of the instantaneous gradient of said curve, and

second means responsive to said gradient signal for determining a significant change in slope of said curve containing said desired point, said second means including means for storing **[**a**]** *said* signal representative of the gradient of said curve in the generally linear portion thereof and for developing a control signal when said instantaneous gradient signal in the portion of said curve beyond said generally linear portion has a predetermined relationship relative to said stored signal.

DEFENSIVE PUBLICATIONS

PUBLISHED DECEMBER 6, 1983

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T103,701
NUCLEATED POLYESTER COMPOSITION CONTAINING RED PHOSPHORUS

Harold W. Tuller, Jones La., Long Valley, N.J. 07853; Nicholas Vanderkooi, Jr., 8 Van Riper Ave., Pompton Plains, N.J. 07444; John C. Haylock, 153 Conestoga Ter., Sparta, N.J. 07871, and Theodore Largman, 7 Upper Field Rd., Morristown, N.J. 07960

Filed Jan. 3, 1983, Ser. No. 455,341
Int. Cl.[3] C08K *3/02*
U.S. Cl. 524—293
No Drawing. 32 Pages Specification

A polyester composition comprising the salt of a dimer acid, trimer or salt of a mixture of dimer acid and trimer acid, and from 0.5 to 10 percent fine particulate red phosphorous. The salt is preferably the sodium salt of the dimer and/or trimer acids. Alternately, the salt can be the sodium salt of an organic polymer having pendant carboxyl groups. The red phosphorous can contain a phosphine suppressant such as a metal hydroxide or copper compound. The preferred red phosphorous used is believed to be coated with an aliphatic polyamine and bisphenol A, epichlorohydrin condensate, reacted with acrylonitrile and ethylene oxide produced by American Hoescht as Exolite ^{TM}405. The composition can contain a filler, plasticizer, impact modifier, and/or a polyepoxide.

T103,702
STABILIZATION OF POLYMER BLENDS WITH METAL NITRITES

Kenneth W. Willcox, and James N. Short, both c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Aug. 2, 1982, Ser. No. 403,982
Int. Cl.[3] C08K *3/2 8, 3/10*
U.S. Cl. 524—429
No Drawing. 17 Pages Specification

An alkali metal or alkaline earth metal nitrite is added to a polymer blend comprising (1) block copolymer formed from monovinyl-substituted aromatic hydrocarbon monomer and a conjugated diene monomer and (2) styrene polymer to improve thermal stability and to inhibit gel and fisheye formation.

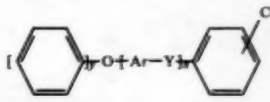
T103,703
PRODUCTION OF AROMATIC POLYKETONES

Howard M. Colquhoun, 25 Beeston Dr., Knutsford, Cheshire, England, and David F. Lewis, 25 Landswood Park, Hartford, Northwich, Cheshire, England

Filed Mar. 1, 1983, Ser. No. 471,156
Claims priority, application United Kingdom, Mar. 17, 1982, 82 07783
Int. Cl.[3] C08G *16/00, 67/00*
U.S. Cl. 528—125
No Drawing. 21 Pages Specification

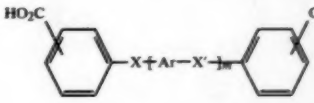
A process for the production of a thermoplastic aromatic polyketone which process comprises reacting in the presence of a fluoroalkane sulphonic acid, preferably CF_3SO_2OH, the reactants selected from the following class:

(a) at least one aromatic monocarboxylic acid of the formula:

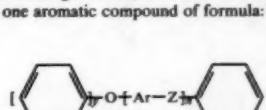


where —Y— is a direct link, —O—, —S—, —NAr′— where Ar′ is a monovalent aromatic radical (preferably phenyl); Ar is a divalent aromatic radical but must not be —Ph—CO—Ph— or —Ph—SO_2—Ph— (where —Ph— is phenylene) when y is 1; and n is an integer of ≧1 and y is an integer of 1 to 3;

(b) a mixture of at least one aromatic dicarboxylic acid of the formula:



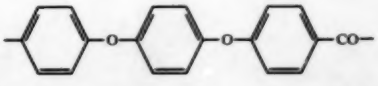
where —X— and —X′— are independently a direct link —O—, —S—, —NAr′— where Ar′ is as defined in (a); m is 0 or an integer of ≧1; and Ar is as defined in (a); and at least one aromatic compound of formula:



where —Z— is —O— or a direct link; and Ar, n, and y are as defined in (a); and

(c) a combination of (a) and (b).

The aromatic carboxylic acid is particular 4-(4-phenoxy)phenoxy benzoic acid which yield an aromatic polyketherketone having repeat units of the formula



REISSUES

DECEMBER 6, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,453
LAUNDRY FEEDING APPARATUS

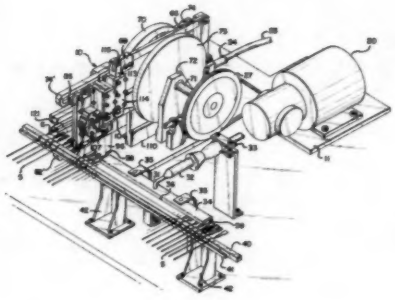
Niels J. Olsen, Bornholm, Denmark, and Henry J. Weir, Dublin, Ireland, assignors to Beta S/A, Luxembourg, Luxembourg

Original No. 4,050,173, dated Sep. 27, 1977, Ser. No. 610,373, Sep. 4, 1975. Application for reissue Sep. 25, 1979, Ser. No. 78,971

Claims priority, application Denmark, Sep. 4, 1974, 4673/74

Int. Cl.³ D06F *67/04*

U.S. Cl. 38—143 25 Claims



[3. Apparatus for spreading and feeding laundry of claim 2, wherein each said transmission comprises:] *Apparatus for spreading and feeding pieces of laundry, comprising:*

a conveyor for receiving laundry from a spreading apparatus; said conveyor having an upstream and a downstream end;

a spreading apparatus comprising at least one pair of clamping devices; each said clamping device including means for holding a piece of laundry; said clamping devices being positioned upstream of said upstream end of said conveyor and above said conveyor; clamping device moving means for moving said clamping devices of said pair thereof apart and together crosswise to the motion of said conveyor and always upstream of said conveyor; said clamping device moving means comprising a separate transmission for each said clamping device; the two said transmissions for said pair of clamping devices moving said clamping devices together and apart, each said transmission comprising:

a first group of stationary pulleys; a second group of movable pulleys; a sliding bar; said second group of pulleys being mounted on said sliding bar; each said sliding bar of each said transmission of said pair of clamping devices being [slidable] *movable* toward and away from said sliding bar of said transmission of the other said clamping device of said pair; means for [sliding] *causing* said sliding bars to move toward each other and apart;

each said transmission further comprising a cable loop passing around both said first and said second pulley groups of said transmission and also being attached to the respective said clamping device, whereby said sliding bar and said clamping device [moves] *move* together; *and*

a blade positioned further upstream from said conveyor than said clamping devices and positioned above said conveyor; said blade being movable toward said conveyor to contact the piece of laundry held by said clamping devices and to move the piece of laundry onto said conveyor .

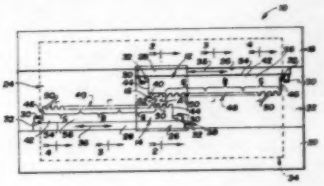
Re. 31,454
MONITORING AND STIMULATION ELECTRODE

Alan C. Hymes, Hopkins, Minn., assignor to LecTec Corporation, Eden Prairie, Minn.

Original No. 4,125,110, dated Nov. 14, 1978, Ser. No. 849,405, Nov. 7, 1977. Continuation of Ser. No. 785,225, Apr. 6, 1977, abandoned, which is a continuation of Ser. No. 635,008, Nov. 25, 1975, abandoned. Application for reissue Nov. 12, 1980, Ser. No. 206,160

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—641 25 Claims



1. An electrode for establishing electrical connection to a patient's skin comprising:

an electrically conductive backing and current distribution member;

electrical terminal means attached to said member, said terminal means being adapted for connection of the electrode to an electrical wire; and

a substrate attached to said backing and current distribution member for interfacing with the patient's skin, said substrate comprising a homogeneous material including between 21% and 65% high molecular weight hydrophilic polysaccharide material, at least about 0.006% electrolytic salt, at least about 0.6% water and an alcohol, said substrate being sufficiently pliant to permit conformation of the shape of the electrode to the body contours, said substrate being sufficiently firm to prevent penetration of the body contours through the substrate thereby preventing contact of the backing member with the skin, and said substrate being uniformly conductive thereby providing a homogeneous conducting surface to the skin.

Re. 31,455
HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

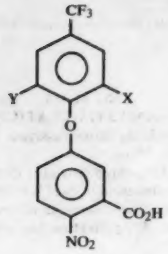
Original No. 4,063,929, dated Dec. 20, 1977, Ser. No. 617,560, Sep. 29, 1975. Continuation-in-part of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. Application for reissue Sep. 1, 1978, Ser. No. 939,292

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

Int. Cl.³ C07C *65/14*; A01N *9/24*

U.S. Cl. 71—115 7 Claims

1. An agronomically-acceptable salt of a compound of the formula



wherein

X is a halogen atom, and

Y is a hydrogen atom [or a halogen atom].

Re. 31,456

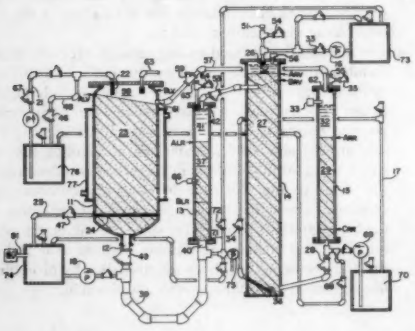
HIGH CAPACITY FOLDED MOVING BED ION EXCHANGE APPARATUS AND METHOD FOR TREATING PHOSPHORIC ACID

Lee G. Carlson, Willow Springs, Ill., assignor to American Petro Mart, Inc., Bartow, Fla.

Original No. 4,280,904, dated Jul. 28, 1981, Ser. No. 7,980, Jan. 31, 1979. Continuation-in-part of Ser. No. 895,817, Apr. 12, 1978, Pat. No. 4,228,001. Application for reissue Sep. 27, 1982, Ser. No. 424,676

Int. Cl.[3] B01D *15/02*

U.S. Cl. 210—676 47 Claims



47. A high capacity moving bed ion exchange method, comprising:

providing a movable ion exchange resin bed within a plurality of columns, said plurality including a loading column, a loading reservoir column, a regeneration column, and a regeneration reservoir column;

flowing a raw aqueous phosphoric acid feed liquid downwardly through said loading column to remove ionic materials therefrom;

removing purified phosphoric acid from the botton portion of said loading column;

passing spent resin beads out of the top portion of said loading column to said regeneration reservoir column;

transferring a portion of the resin in said regeneration reservoir column into said regeneration column;

regenerating at least a portion of the resin in said regeneration column by passing a regenerating solution therethrough;

transferring a portion of the regenerated resin from the regeneration column with regenerating solution therein to the loading reservoir column;

purging said loading reservoir column to remove liquid from intersticies of resin therein;

rinsing said purged resin by moving rinse liquor through the resin in the loading reservoir; and

transferring a portion of purged and rinsed resin from the loading reservoir column into the bottom portion of said loading column;

wherein said purging and rinsing steps for preparing resin for transfer from said loading reservoir column to said loading column include the following sequence:

(a) passing air through the resin in said loading reservoir column to purge liquid therefrom until the resin is in semi-dry condition,

(b) adding to said semi-dry resin purified phosphoric acid after passage thereof through said loading column, and

(c) removing air entrapped within resin in said loading reservoir column before transferring said portion of the purged and rinsed resin to said loading column bottom portion.

Re. 31,457

VISCOSE RAYON

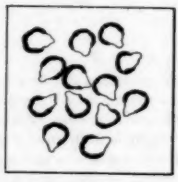
Gregory C. Bockno, Media, Pa., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Original No. 4,245,000, dated Jan. 13, 1981, Ser. No. 21,150, Mar. 16, 1979. Continuation-in-part of Ser. No. 793,572, May 4, 1977, abandoned. Application for reissue Jun. 21, 1982, Ser. No. 390,476

The portion of the term of this patent subsequent to Oct. 17, 1995, has been disclaimed.

Int. Cl.[3] D03D *3/00*

U.S. Cl. 428—224 22 Claims



1. A regenerated cellulose fiber having a wet tenacity about 1.5 to 2.7 grams per denier, a conditioned tenacity of about 2.8 to 4.0 grams per denier, a wet % elongation between about 14% and 27%, a conditioned % elongation between 11% and 22%, and having a wet modulus between 5.0 and 12.0 and being further characterized in having a multilobular, skin core cross-section wherein the core is surrounded by a discontinuous broken skin, and a crimp level of 10 to 30 crimps per inch and having been formed by the method comprising

(a) preparing a modifier-free viscose containing from about 6% to 10% cellulose, from about 4% to 9% caustic soda, and from 28% to 45% carbon disulfide based upon the weight of cellulose, ripening the viscose to a sodium chloride salt index of 5.5 to 15 and a spinning ball fall of 60 to 110 seconds,

(b) extruding the ripened viscose into an aqueous spinning bath containing from about 4% to 8% sulfuric acid, from about 0.5% to 3.0% zinc sulfate and from about 16% to 22% sodium sulfate, maintained at a temperature between 40 and 60 degrees centigrade,

(c) withdrawing the filaments through an aqueous stretch bath maintained at a temperature between 80 and 98 degrees centigrade, [and]

(d) controlling residence time in the spin bath so as to allow stretching the filaments in the stretch bath from about 65% to 120%.

(e) cutting the stretched filaments into staple length fibers, and

(f) relaxing the cut fibers in water having a temperature between about 75 and 100 degrees centigrade.

Re. 31,458

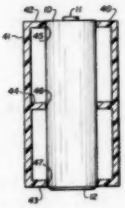
ADAPTER FOR DRY CELL BATTERIES

Burton C. Trattner, Hempstead, N.Y., assignor to Albert C. Nolte, Jr., Jericho, N.Y., a part interest

Original No. 3,969,148, dated Jul. 13, 1976, Ser. No. 579,632, May 21, 1975. Continuation of Ser. No. 833,831, Sep. 16, 1977, abandoned, which is a continuation of Ser. No. 441,731, Mar. 13, 1974, abandoned, which is a continuation of Ser. No. 321,610, Jan. 8, 1973, abandoned, which is a continuation of Ser. No. 135,289, Apr. 19, 1971, abandoned. Application for reissue Feb. 22, 1979, Ser. No. 19,941

Int. Cl.³ H01M *2/10*

U.S. Cl. 429—100 **10 Claims**



5. In combination; a dry cell battery of a first nominal cross section and an adapter to render the battery interchangeable with a battery of a second, larger nominal cross section, said adapter comprising a body having disposed therein means for defining a cylindrical central through passage with openings at opposite ends of said body, the passage for receiving a battery of said first nominal size insertable thereinto and removable therefrom from either of said openings in the ends of said body, the cylindrical central through passage having the battery received therein and said means for defining the cylindrical central through passage having at least two elements projecting into the cylindrical central through passage for engaging and supporting said battery, the external transverse dimensions of said body being substantially similar to those of a battery of said second and larger nominal size.

Re. 31,459

SOLID STATE FORCE TRANSDUCER AND METHOD OF MAKING SAME

Barry Block, 30610 Page Mill Rd., Los Alto, Calif. 94022, assignor to Harry E. Aine and Barry Block, both of Los Altos, Calif.

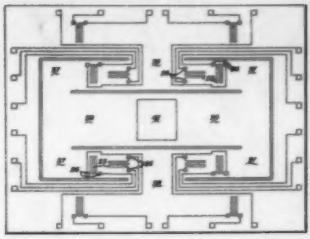
Original No. 4,071,838, dated Jan. 31, 1978, Ser. No. 656,632, Feb. 9, 1976. Application for reissue Jan. 28, 1980, Ser. No. 115,610

Int. Cl.³ H01L *10/10*

U.S. Cl. 338—47 **33 Claims**

38. In a method for fabricating a solid state force transducer, the step of:

forming a folded cantilever leaf spring transducer structure in a wafer by removing portions of the wafer at a selected location through at least one of the major faces of said wafer to define the folded cantilever spring transducer structure, said folded cantilever spring structure including a folded portion having first and second generally parallel coplanar leaf spring leg portions joined together at a joined first end region thereof and second ends of said leg portions being displaceable one with respect to the other, in responsive to the applied force to be transduced, along an axis of maximum compliance generally orthogonal to the plane of said folded leaf spring leg portions and passing through said second end of said first leg portion, the second end of said second leg portion forming a point of support for said folded cantilever spring portion with said joined region of said leaf spring also being displaceable



relative to said point of support in response to the applied force being transduced.

Re. 31,460

METHOD AND APPARATUS FOR STANDARDS CONVERSION OF TELEVISION SIGNALS

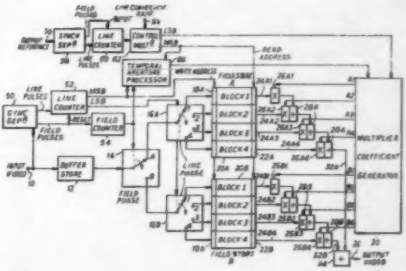
Christopher J. Dalton, High Wycombe, and Graham D. Roe, Great Missenden, both of England, assignors to British Broadcast Corporation, London, England

Original No. 4,276,565, dated Jun. 30, 1981, Ser. No. 3,451, Jan. 15, 1979. Application for reissue Jun. 3, 1982, Ser. No. 384,538

Claims priority, application United Kingdom, Jan. 18, 1978, 02068/78

Int. Cl.³ H04N *5/02*

U.S. Cl. 358—140 **14 Claims**



1. A method of simultaneously enabling different parts of an input video signal to be made available, using signal storage, comprising the steps of:

cyclically writing successive [portions] *lines* of the input video signal relating to successive portions of the video picture into *successive ones of* a plurality of [successive] random access store sections, each of which is capable of storing several video lines but less than one field, *said sections providing a total storage of at least two consecutive fields,* using in each cycle [write addresses for] *essentially the same write address sequences within* the different sections [which are unambiguously related];

incrementing the write addresses for successive cycles; and

reading from the *store* sections using for each section read addresses which are related to each other and to the write addresses so as *simultaneously* to access a desired set of [stored signal portions] *line samples from corresponding positions from a plurality of stored lines with each line sample of the set being read from a different store section.*

PLANT PATENTS

GRANTED DECEMBER 6, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,151
GRAPEVINE

Luther C. Hahn, Thermal, and Joseph Maranto, Bakersfield, both of Calif., assignors to Superior Farming Company, Bakersfield, Calif.

Filed Jan. 11, 1982, Ser. No. 338,372
Int. Cl.³ A01H *5/03*
U.S. Cl. Plt.—47 **1 Claim**

1. A new and distinct variety of grapevine, substantially as illustrated and described, which is characterized by a very large, vigorous productive vine, having a slender trunk and very long split straps, reddish brown bark, medium to long cane and round, slightly enlarged nodes and shoots basically green with reddish longitudinal striations and tips growing straight up, bifurcated and trifurcated tendrils, medium size bud, slightly pointed, medium size leaves with U shaped petiolar sinus; date of bloom and fruit ripening 7–10 days earlier than Superior Seedless (U.S. Plant Pat. No. 3,106) and 14 days earlier than Thompson Seedless (unpatented); clusters of medium size, loose to compact, seedless white colored berries irregular in size, mostly large, firm, crisp, attractive, sweet taste, attributable to an early high solids-sugar and low acid content.

5,152
ROSE PLANT JACGUM

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Mar. 1, 1982, Ser. No. 353,023
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its abundant red buds and blooms borne on a low, dense plant with small disease resistant foliage.

5,153
IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 354,076
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens plant known by the cultivar name Cosmos, as described and illustrated, and particularly characterized by its intense mauve flower color; long, narrow variegated foliage; self-branching, thin stems and procumbent growth, making the cultivar ideal for hanging baskets; early and continous flowering, with flower intensity and variegation being most pronounced in high light conditions.

5,154
PAMELA HETHERINGTON CORONATION

Ernest E. Hetherington, Arcadia, Calif., assignor to Fred A. Stewart Inc., San Gabriel, Calif.

Filed Jul. 8, 1982, Ser. No. 396,241
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of hybrid orchid, substantially as described and illustrated herein, and distinguished from its parent (grex Blc. Pamela Hetherington) and other orchids by its combination of delicate, lilac-rose flower color, superior flower substance, strength of stem structure, and vigorous, reliable blooming.

PATENTS

GRANTED DEC. 6, 1983

ERRATA

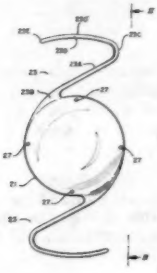
For CLASS	See PATENT NO.
445–035	4,418,452
381–105	4,418,599
383–011	4,418,733
206–279	4,418,805
420–584	4,419,129
126–089	4,419,139
502–026	4,419,267
502–158	4,419,268
502–169	4,419,269
502–209	4,419,270
502–065	4,419,271
502–084	4,419,272
502–080	4,419,273
502–304	4,419,274
502–322	4,419,275
502–347	4,419,276
585–435	4,419,526
381–051	4,419,540
381–007	4,419,541

PATENTS

GRANTED DECEMBER 6, 1983

GENERAL AND MECHANICAL

4,418,431
INTRAOCULAR LENS
Fred T. Feaster, 800 8th Ave., Suite 234, Ft. Worth, Tex. 76104
Filed Dec. 17, 1981, Ser. No. 331,645
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **46 Claims**



16. An intraocular insert suitable for use as an artificial lens implant in the anterior chamber or posterior chamber of a human eye, comprising:

a lens body having first and second position fixation members extending from opposite sides of the periphery of said lens body,

each of said first and second position fixation members comprising an arm portion having a base joined to the periphery of said lens body with said arm portion extending from said lens body, an elbow, and an elongated outward-convex seating portion having a first end joined to said arm portion by said elbow, and an opposite free end, said elongated outward-convex seating portion being located outward of said arm portion relative to said lens body,

the two bases of said arm portions of said first and second position fixation members being located on opposite sides of said lens body and on opposite sides of a plane coinciding with and passing through the axis of said lens body, said plane also passing through said arm portions and through said outward-convex seating portions,

each arm portion of each of said position fixation members crosses said plane from its base and has its elbow including the inside edge of its elbow located on a side of said plane opposite the side on which its base is located,

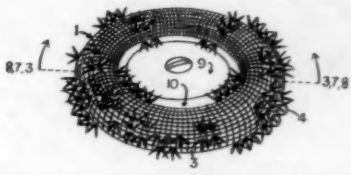
each outward-convex seating portion of each of said position fixation members extends from its elbow in a direction such that it crosses said plane with its free end located on the side of said plane on which its base is located,

the curvature of the elbow of each of said position fixation members is much sharper than the curvature of its outward-convex seating portion,

each position fixation member being relatively small in cross-section and resilient such that its arm portion may be moved toward said lens body and its elongated outward-convex seating portion may be moved toward its arm portion and hence toward said lens body,

each of said outward-convex seating portions providing a broad area of tissue contact and fixation when said insert is implanted in the eye.

4,418,432
DRAIN FILTER HAVING FILAMENTARY SURFACE IRREGULARITIES TO ENTANGLE HAIR AND DEBRIS
Stella M. Vidal, 175 SW. 14th St., Apt. 3, Miami, Fla. 33130
Filed Aug. 26, 1981, Ser. No. 296,293
Int. Cl.³ A47K *1/14*; E03C *1/26, 1/264*
U.S. Cl. 4—286 **65 Claims**



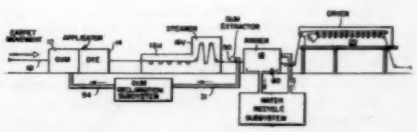
1. An article for preventing hair and debris from entering a drain of a bathtub, shower stall, lavatory, sink and the like having a liftable stopper and flange, said article comprising:

a unitary body shaped and dimensioned to be adapted to extend entirely around the lifted stopper periphery and to extend entirely around the external periphery of the drain generally covering the area between the drain periphery and the top of the lifted stopper periphery;

said body being of filamentary material defining openings for the free passage of water therethrough down into the drain;

a plurality of outward projections connected to said filamentary material above said opening and cooperating therewith, operable to entangle and hold hair and debris carried by water flowing through said openings.

4,418,433
METHOD AND SYSTEM FOR RECLAIMING AND RECYCLING GUM AND WATER IN A CARPET DYEING PROCESS
Ronald Moreland, Chatsworth, and Marion L. Hawkins, Dalton, both of Ga., assignors to Diamond Carpet Mills, Incorporated, Eton, Ga.
Filed Aug. 7, 1981, Ser. No. 290,935
Int. Cl.³ D06B *21/00, 23/20*
U.S. Cl. 8—149.1 **21 Claims**



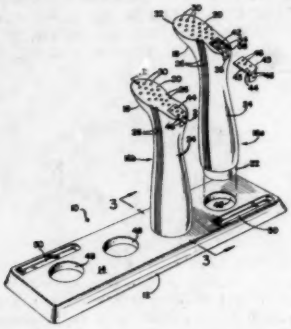
1. In method of reclamation of gum from a dyeing process for coloring the pile yarns of a carpet web or the like, continuously conveyed through several operating stages wherein the carpet web is coated at one of said stages with a continuous layer of viscous gum and has applied thereto a dyeing agent for coloring the pile yarns of the web and is passed through a steamer stage for setting of the dye in the pile yarns, the improvement comprising:

(a) extracting gum from the carpet web after it exits the steamer stage where the dye has been set, the gum being extracted before rinsing of the pile yarns,

(b) filtering the extracted gum,

(c) returning the filtered gum to one of said stages for reuse in the dyeing process.

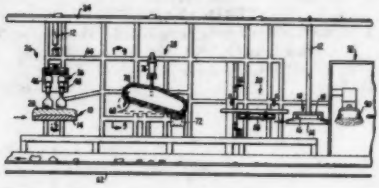
4,418,434
DEODORIZING BOOT STAND
Choon S. Joh, 788 Rodriquez St. #61, Watsonville, Calif. 95076
Filed Mar. 8, 1982, Ser. No. 355,352
Int. Cl.³ A43D 3/00
U.S. Cl. 12—128 B 10 Claims



1. Apparatus for the storage of articles of footware comprising:
a base;
at least a pair of form members shaped and dimensioned substantially to conform to the shape and dimensions of a selected pair of footware articles to be stored thereon, and thereby adapted to maintain the shape of said footware articles when one of said form members is inserted into the interior of one of said footware articles, said form members each having a first end and a second end, said first end having a lateral surface configured generally in the form of a shoe-sole, each of said form members having a hollow portion at least at said first end;
means for removably attaching said second end of each of said form members to said base;
a plurality of holes in said lateral surface of each of said form members, said holes communicating with said hollow portion thereof;
a recessed compartment, integrally formed in each of said form members near said first end thereof, and having a plurality of holes communicating with said hollow portion;
means for accessing said compartment from the exterior of said form member; and
closure means for selectably opening and closing said means for accessing;
whereby said compartment is adapted to receive a deodorizing or disinfecting substance productive of vapors, said vapors being passed from said compartment to the interior of said article of footware through said holes in said compartment, said hollow portion, and said holes in said lateral surface when said article of footware is stored on said form member.

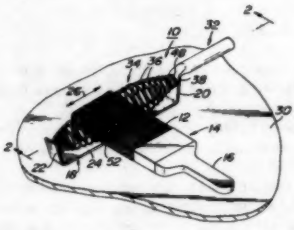
4,418,435
CARBON BUTT CLEANING APPARATUS AND METHOD
J. Edgar Arnold, Summerville, S.C., assignor to Alumax, Inc., San Mateo, Calif.
Filed Mar. 22, 1982, Ser. No. 360,454
Int. Cl.³ B08B 1/02
U.S. Cl. 15—4 10 Claims

1. Apparatus for cleaning cryolite from spent anodes comprising a plurality of automatic processing stations, overhead transportion means for automatically transporting separate spent anodes from and through each such station, first jackhammer means at a first one of the processing stations for breaking the cryolite loose from the top side surfaces of each anode passing through the station, rotary scraper means at a second one of the processing stations for scraping off cryolite loosened at the first station, second jackhammer means at a third one of the processing stations for knocking cryolite from



the center of the top surface of each anode passing through the third station and rotating brush means at a fourth one of the processing stations for brushing loosened cryolite from each anode passing through the fourth station.

4,418,436
BRUSH BRISTLE CLEANING SYSTEM
Abraham Eisenberg, 6604 Chippewa Dr., Baltimore, Md. 21209
Filed Feb. 22, 1982, Ser. No. 351,011
Int. Cl.³ A46B 17/06
U.S. Cl. 15—104 R 9 Claims

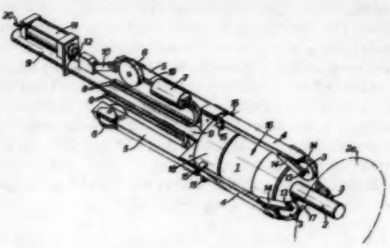


1. A brush bristle cleaning system including:
(a) a frame defining a longitudinally extending base member;
(b) a handle member; and,
(c) a helical wire element defining a plurality of helical loops, said helical wire element extending in said longitudinal direction, said helical wire element being secured to said frame and said handle member, said helical wire element being fixedly secured to said frame at discrete locations.

4,418,437
PIPE CLEANING APPARATUS
James R. French, Hornerthorpe, Butt La., Great Yarmouth, Norfolk, England
Filed Mar. 5, 1982, Ser. No. 355,192
Claims priority, application United Kingdom, Mar. 12, 1981, 8107823
Int. Cl.³ B08B 9/04
U.S. Cl. 15—104.09 10 Claims

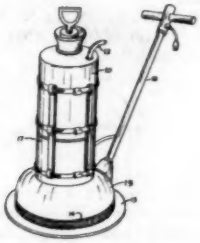
1. Apparatus for cleaning the bore of a pipe comprising: a housing means, a cleaning tool motor mounted in said housing means with its drive shaft extending from the housing means and adapted to receive a pipe cleaning tool rotatable with the drive shaft, at least three guide devices, support means connected to the housing means and supporting said guide devices and disposed around the housing means in spaced apart relationship towards the drive shaft end of the housing so as in use to bear against the bore of a pipe to be cleaned thereby to position the drive shaft coaxially of the pipe, drive wheel

means for advancing said housing means through a pipe, means for mounting said drive wheel means on said housing means, drive motor means operatively associated with the drive wheel means for driving the apparatus through a pipe to be cleaned,



a jacking means for the drive wheel means which extends away from the end of the housing means remote from the drive shaft, and actuator means operative for actuating said jacking means for jacking the drive wheel means into driving contact with the wall of a pipe to be cleaned.

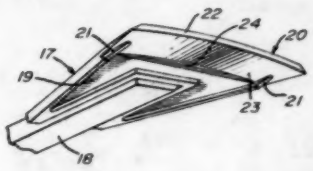
4,418,438
ROTARY CARPET CLEANING PAD
Barry L. Cutler, 7 Stanford Ct., E. Windsor, N.J. 08520
Filed Aug. 2, 1982, Ser. No. 404,602
Int. Cl.³ A47L *11/14*
U.S. Cl. 15—230 **7 Claims**



1. A carpet cleaning pad for rotary floor cleaning machines comprising a disc of a base sheet material and supported therein the following: an annular strip of fibrous bristles around the periphery of the disc, a plurality of substantially radial strips of fibrous bristles and a bed of firmly looped strands woven to a hooked rug solidity to present a compact cleaning surface filling in the remaining areas within said annular strip.

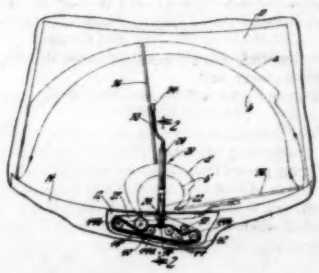
4,418,439
CURVED GLASS ICE-SCRAPER
Marcel Porchet, 2265 Brebeuf St., Apt. 9, Longueuil, Canada J4J 3P9
Filed Jan. 29, 1982, Ser. No. 344,887
Claims priority, application Canada, Jun. 25, 1981, 380604
Int. Cl.³ B60S *1/04*; A47L *1/06*
U.S. Cl. 15—236 R **2 Claims**

1. An ice-scraper for the outer convex surface of a vehicle window, comprising a body of flat triangular shape and made of a cast one-piece flexible and resilient plastic material, said body having a straight base edge, an opposite apex portion and converging side edges, said straight base edge bevelled to form a scraping edge, said body having a slit parallel to said base edge and located intermediate said base edge and said apex portion, said slit terminating short of and at a generally equal distance from the respective side edges, the part of said body lying between said slit and said base edge forming a blade portion, and the part of said body extending from said slit towards and including said apex portion forming a shank portion, said base portion being integrally connected to said shank portion solely beyond the ends of said slit, whereby said blade



portion can flex in a direction parallel to said base edge when applied against a convex window surface by pressure applied on the ends of said blade portion through said shank portion, and a separate handle rigidly secured to said shank portion, extending away from said body and generally perpendicular to said base edge.

4,418,440
WINDSHIELD WIPER APPARATUS
Stephen Sigety, Jr., Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 6, 1982, Ser. No. 395,145
Int. Cl.³ B60S *1/18, 1/36*
U.S. Cl. 15—250.21 **3 Claims**

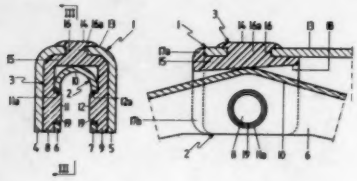


1. Vehicle windshield wiper apparatus comprising, a guide arm, means rotatably mounting the guide arm adjacent one end thereof on an axis of the vehicle, a wiper arm mounted on the guide arm for translation relative thereto and unitary rotation therewith about said axis, wiper means on the wiper arm adapted to clean the vehicle windshield, and endless belt drive means connected to the wiper arm adjacent one end thereof to move such end along a predetermined path noncentric with said axis whereby the guide arm and wiper arm are oscillated as a unit about said axis and the wiper arm simultaneously translated relative the guide arm to provide a corresponding predetermined area of cleaning of the windshield by the wiper means.

4,418,441
SPACER FOR ROTATABLY CONNECTING WIPER BLADE PARTS

Johan H. van den Berg, Hasselt, Belgium, assignor to Champion Spark Plug Europe S.A., Binche, Belgium

Filed Oct. 14, 1981, Ser. No. 311,315
Claims priority, application France, Oct. 15, 1980, 80 22030
Int. Cl.³ B60S 1/38
U.S. Cl. 15—250.42 12 Claims

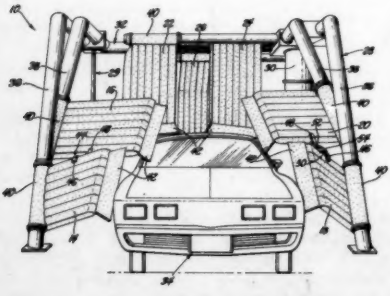


1. A spacer (3) for rotatably connecting a first yoke (1) to a second yoke (2) of a wiper blade assembly, the first yoke (1) having at the outer end portion substantially the form of an inverted U with the flanges (4, 5) joined by a web (13), said spacer (3) having substantially the form of an inverted U with a pair of flanges (8, 9) joined by a web (15), the spacer (3) being provided with first means (16a, 14, 21a) for securing the spacer (3) to the first yoke (1) and provided with second means (11, 12, 23, 24, 31, 32) for rotatably securing the spacer to the second yoke (2), characterized in that said first means (16a, 14, 21a) are integrally formed on the web (15) of said inverted U of the spacer and project in a direction opposite to the direction of the flanges (8, 9) of the spacer, said first means are secured to the web (13) of the first yoke (1), said second means (11, 12, 23, 24, 31, 32) are integrally formed on the two flanges (8, 9) of the inverted U of the spacer and project toward each other, said second means are pivotally secured to said second yoke (2), the flanges (4, 5) of the first yoke surround the flanges (8, 9) of the spacer for holding the second means (11, 12, 23, 24, 31, 32) of the spacer (3) assembled with the second yoke (2).

4,418,442
FLUID STRIPPING APPARATUS INCLUDING A STRAP FOR INTERCONNECTING ADJACENT AIRBAGS

David R. Day, 4334 Ocean Dr., Apt. 203, Corpus Christi, Tex. 78012, and Lucian G. McElroy, 3315 Brocker Rd., Metamora, Mich. 48455

Filed May 17, 1982, Ser. No. 378,956
Int. Cl.³ B60S 3/04
U.S. Cl. 15—312 A 11 Claims

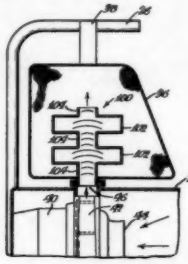


1. An apparatus (10) for stripping fluids from the surface of a vehicle, said apparatus (10) comprising: an air distributor (28); inflatable bags (14,-26), each of generally rectangular transverse cross section, said bags 14–26 supported by said air distributor (28) and each of said bags (14–26) including an inlet end (40) connected to said air distributor (28) for introducing air under pressure into said bags (14–26) and a nozzle end (42) of smaller area than said inlet end (40) spaced apart from said inlet end (40) for emitting a stream of air while maintaining said bags (14–26) in a nonflailing and inflated orientation, and characterized by connector means (44) having one end portion (46) secured to a first of said bags (14, 18) and a second end portion (48) secured to a second of said bags (16, 20) disposed above said first bag and spaced along said bags (14–20) from said air distributor (28) for connecting said first bag (14, 18) to said second bag (16, 20) for properly positioning said second bag (16, 20) in relation to a vehicle body when said first bag (14, 18) is deflected by the engaging vehicle (34).

4,418,443
NOISE SUPPRESSOR FOR VACUUM SWEEPERS AND THE LIKE

Ernest J. Fischer, Skokie, Ill., assignor to Breuer Electric Mfg. Co., Chicago, Ill.

Filed Dec. 7, 1981, Ser. No. 328,123
Int. Cl.³ A47L 9/00
U.S. Cl. 15—326 15 Claims



1. In combination with an enclosure for connection with an exhaust outlet from an air blower, wherein said enclosure has means for exhausting air introduced therein, a sound reducing muffler comprising a housing having a cylindrical wall of a first diameter and planar end walls which extend from opposite circumferences of said cylindrical wall toward and perpendicular to the axis thereof and have circular openings of a second and smaller diameter formed therethrough coaxial with said axis of said cylindrical wall, and first and second tubular members of said second diameter, each connected at one end with a respective one of said planar end walls about the circumference of the opening therein to extend outwardly, but not inwardly, of said housing, an opposite end of said first tubular member being connectable with the exhaust outlet from the air blower to extend an opposite end of said second tubular member to interior of said enclosure for conveying air from the blower into said enclosure, said muffler acting as a low pass noise filter to reduce high frequency noises attending passage of air through the blower.

4,418,444

APPARATUS FOR SEPARATING THE NECK OF A HEADLESS PLUCKED FOWL

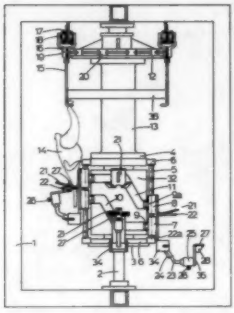
Pieter Meyn, and Cornelis Meyn, both of Oostzaan, Netherlands, assignors to Meyn Machinefabriek BV, Oostzaan, Netherlands

Filed Mar. 25, 1982, Ser. No. 362,036

Claims priority, application Netherlands, Mar. 27, 1981, 8101528

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—11 5 Claims



1. An apparatus for separating the neck of a headless plucked fowl hanging by the ankle joints from a hook of an overhead conveyor, said apparatus comprising

a frame,

at least one horizontally extending fork-shaped clamping member adapted to receive the neck of a fowl suspended from said conveyor, said clamping member being mounted in said frame for movement along with said conveyor and for vertical movement up and down relative to the fowl,

means for controlling the vertical movement of said clamping member,

a pressure arm co-operating with said clamping member and pivotally mounted with respect to the latter for movement between a first rest position free of the fork opening of said clamping member and a second operating position closing said fork opening and pressing the fowl's neck received in the clamping member to pinch off the vertebrae of the neck from the remaining part of the spinal column of the fowl while leaving the skin of the neck intact,

means for operating said pressure arm in timed relationship to the movements of said clamping member, said means moving said arm to its said second position when the clamping member is substantially in its upper position,

a second fork member situated above said clamping member, likewise mounted in said frame for movement along with said conveyor and for vertical movement up and down relative to the fowl, said fork member being adapted to support the fowl on both sides of its neck, and

means for moving said fork member in timed relationship with the movement of said clamping member in such a manner that said two members are moved together upwards with the fork member close above the clamping member and that, after the operation of the pressure arm to break the fowl's neck, the fork member remains in its upper position supporting the fowl while the clamping member together with the pressure arm is moved downwards whereby the separated neck vertebrae are at least partially pulled out of the skin of the neck through the opening previously formed by the removal of the fowl's head.

4,418,445

APPARATUS FOR CUTTING OPEN A FOWL BY A TRANSVERSE CUT

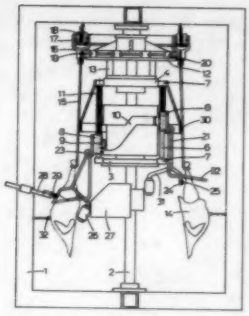
Pieter Meyn, and Cornelis Meyn, both of Oostzaan, Netherlands, assignors to Meyn Machinefabriek BV, Oostzaan, Netherlands

Filed Mar. 25, 1982, Ser. No. 362,037

Claims priority, application Netherlands, Mar. 27, 1981, 8101527

Int. Cl.³ A22C *21/06*

U.S. Cl. 17—11 4 Claims



1. Apparatus for opening the body cavity of a fowl by a transverse cut which fowl is hanging by the ankle joints from a hook of an overhead conveyor, the vent of which fowl having been previously cut out, said apparatus comprising

a frame,

cutting means carried by said frame in a stationary position with respect to said conveyor,

at least one guide means movably connected to said frame,

means for moving said guide means along with said conveyor,

slide means vertically reciprocatably mounted on said guide means,

means for moving said slide means along said guide means towards and away from a fowl carried by said conveyor,

means carried by said slide means for engaging and holding the fowl in a position allowing it to be cut by said stationary cutting means as it is carried along by said conveyor in a pre-determined path of travel,

said holding means comprising a stretching member movably connected to said slide means for reciprocating movements between a first position in which said stretching member can be inserted into the body cavity of the fowl through the vent opening cut out therein and a second position outwardly of said first position,

means for moving said stretching member between said two positions in synchronisation with the movements of said slide means,

whereby on the downward movement of the slide means the stretching member in its said first position is inserted into the fowl body cavity and then moved to its second position to stretch the skin of the fowl upwardly towards said stationary cutting means.

4,418,446

MOLD ASSEMBLY FOR FOOD PATTY MOLDING MACHINE

Kenneth Sandberg, Lockport, and James Stoub, Oak Forest, both of Ill., assignors to Formax, Inc., Mokena, Ill.

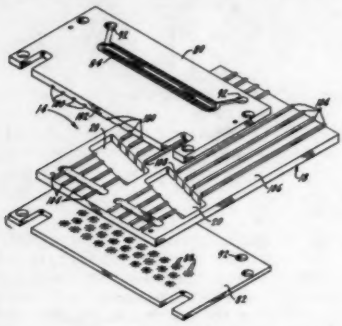
Continuation of Ser. No. 240,955, Mar. 5, 1981, abandoned. This application Mar. 24, 1982, Ser. No. 361,186

Int. Cl.³ A22C *7/00*

U.S. Cl. 17—32 5 Claims

1. In a food patty molding machine of the kind comprising:

a mold plate including at least one mold cavity extending through the plate;
a pair of mold closure plates, engaging opposed surfaces of the mold plate in close-fitting surface-to-surface engagement;
mold plate drive means for cyclically driving the mold plate along a given path, between the closure plates, from a fill position to a discharge position and back to the fill position;
a fill passage having one end extending through one closure plate, communicating with the mold cavity when the mold plate is in its fill position;
and a food pump for pumping a moldable food product through the fill passage into the mold cavity;



an improved mold assembly, enabling the machine to form patties having non-planar main surfaces, comprising:
at least one rib-forming channel of uniform cross-sectional shape throughout its length formed in the surface of each closure plate engaging a surface of the mold plate, the rib-forming channel extending longitudinally of the closure plate surface parallel to the path of movement of the mold plate and traversing the mold cavity;
and at least one rib-forming projection extending longitudinally of each closure-plate-engaging surface of the mold plate, complementary in cross-sectional shape to the rib-forming channel in the adjacent closure plate, in close-fitting sliding engagement in the rib-forming channel in the adjacent closure plate.

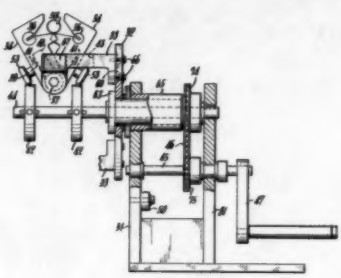
4,418,447

METHOD AND APPARATUS FOR PROCESSING STUFFED SAUSAGE CASING

Francis J. Ziolko, Bridgewater, N.J., assignor to Devro, Inc., Somerville, N.J.

Filed Jul. 2, 1981, Ser. No. 279,895
Int. Cl.³ A22C *11/00*
U.S. Cl. 17—34 **12 Claims**

1. Apparatus for forming individual sausage links comprising:
a support frame;
a mounting means attached to the support frame and capable of moving in an endless cycle;
means to move said mounting means;
a plurality of support brackets affixed at spaced points on said mounting means;
a pair of forming arms attached to each of said support brackets;
each of said forming arms having an inner surface which faces the inner surface of the other forming arm in the same pair of forming arms and an outer surface which is opposite the inner surface;
each of said forming arms having at the end of said arm an opening which faces toward the opening in the other forming arm of the same pair;
a slot in the closed end of each opening;
and a cutting edge at the closed end of said slot in at least a portion of the total number of forming arms;
means to direct a filled casing into the space formed by the opening in a pair of forming arms;
a follower attached to at least one of the forming arms in each pair;



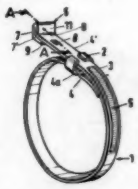
an actuator attached to said support frame and operatively connected to said forming arms through said followers to first move at least one of the forming arms in each pair toward one another to contact the filled casing when said mounting means is moved in an endless cycle;
said actuator being capable of moving said forming arms toward one another until the cutting surfaces in a pair of forming arms overlap, thereby cutting the casing into an individual link.

4,418,448

CLAMP FOR HOSES OR THE LIKE

Heinz Sauer, Ronneburg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 343,740
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122656
Int. Cl.³ B65D *63/02, 63/00*; A44B *21/00*
U.S. Cl. 24—20 TT **7 Claims**



1. A clamp for hoses of the like, comprising an elongated strap including a toothed loop-shaped intermediate portion, a toothed first end portion overlapped by and meshing with said intermediate portion, and a second end portion extending from said intermediate portion and comprising a bendable tensioning projection extending outwardly in a direction away from said intermediate portion and having a first face extending substantially transversely of said strap, said second end portion further including an integral protuberance offset with respect to the general plane of said second end portion, extending toward said intermediate portion and having a second face adjacent to said first face and arranged to oppose bending of said projection when the projection is urged in a direction to reduce the size of said intermediate portion, said projection constituting a folded-over part of said second end portion and including two mutually inclined legs one of which extends outwardly and the other of which includes a panel provided with said first face

and disposed at that side of said second end portion which faces said intermediate portion.

4,418,449

SLIDE FASTENER

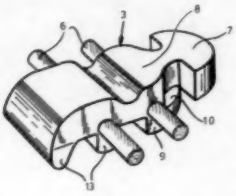
Helmut Heimberger, Steinhausen, and Helmut Wulz, Birmensdorf, both of Switzerland, assignors to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

Filed Oct. 16, 1980, Ser. No. 197,597

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1979, 2942009; Nov. 16, 1979, 2946229

Int. Cl.³ A44B *19/06*

U.S. Cl. 24—401 **6 Claims**



1. A slide-fastener stringer comprising:

a pair of support tapes having confronting edges;

respective coupling elements extending along said edges and interdigitating upon movement of a slide along said coupling elements; and

means for securing said coupling elements to said tape, each of said coupling elements comprising:

at least one connecting textile cord running the length of the coupling element inwardly of the respective edge, and

a multiplicity of flat one-arm unbent coupling members affixed to said textile cord and projecting therefrom over the respective edge, each of said coupling members:

having a bottom surface bearing upon one side of said tape,

having a plane parallel to said tapes and subdividing each coupling member into an upper part and a lower part, said parts being molded unitarily with one another and lying above said bottom surface,

having a mushroom-shaped head projecting beyond the respective edge and formed exclusively on the upper part, and a neck reaching toward said edge,

having a pair of ledges formed above said bottom surface exclusively on said lower part with upwardly facing surfaces in said plane laterally projecting beyond said neck for engagement with interdigitating heads of the coupling element of the other tape to lock the interdigitated heads against forces perpendicular to said plane, and

having a shank region inwardly of the respective edge and engaged by said means, said shank region lying above said plane and embedding said cord therein.

4,418,450

WEB FITTING WITH WEBBING PROTECTOR

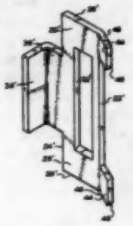
Roger Nelson, Howell, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed May 15, 1981, Ser. No. 263,973

Int. Cl.³ B61D *45/00, 63/00*

U.S. Cl. 24—265 CD **6 Claims**

5. In a fitting retainer to be used in pairs with a web loop, a substantially planar body having inner and outer surfaces, an outer edge, an inner edge, end edges, an elongated web receiving opening having ends and a length substantially parallel to said outer edge, and a locking tab extending from said inner edge intermediate said end edges having a portion transversely disposed to the plane of said body, the improvement comprising, an extension defined on said body adjacent each end edge and off-set with respect to said web receiving opening ends and extending beyond said outer edge a distance at least as great as



the thickness of the web to be used with said body whereby said extensions extend beyond webbing passing over said outer edge to protect the webbing from being crushed against the outer edge, said extensions being separated by a distance at least as great as the length of the web receiving opening.

4,418,451

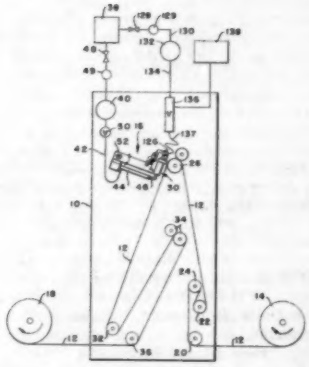
METHODS FOR THE PRODUCTION OF MULTI-LEVEL SURFACE PATTERNED MATERIALS

Edward L. Crenshaw, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 23, 1981, Ser. No. 227,723

Int. Cl.³ D06C *23/04*

U.S. Cl. 26—2 R **10 Claims**



1. In a method of patterning a substrate material containing thermally modifiable surface components by directing streams of heated pressurized fluid into the surface of a relatively moving substrate material to thermally modify and reduce the height of surface areas contacted by the streams while starting and stopping the flow of selected of the streams in accordance with pattern control information; the improvement therein comprising the step of controllably varying the temperature of selected of the heated fluid streams striking selected of said surface areas during relative movement of the substrate material by introducing a controlled amount of cooler fluid into the flow of the heated fluid stream striking each of said selected surface areas to correspondingly vary the height reduction of said selected surface areas and produce a surface pattern characterized by surface areas of high, low and intermediate height while maintaining the length of each of said selected streams.

7. In a method of patterning the pile surface of a relatively

moving pile fabric containing thermally modifiable pile yarn components by selective application of streams of pressurized heated fluid into pile surface areas of the fabric in accordance with pattern control information to reduce the pile height in said surface areas, the improvement therewith comprising the steps of controllably varying the temperature of selected of the fluid streams striking selected of said pile surface areas during relative movement of the fabric by rapidly introducing a controlled amount of cooler fluid into the flow of each of said selected fluid streams to controllably vary the fluid stream temperatures during relative movement of the surface area thereby to correspondingly vary the degree of reduction of the pile height in said surface portions and produce a surface pattern in the pile fabric characterized by high, low, and intermediate levels of pile height while maintaining the length of each of said selected streams.

4,418,452

X-RAY DETECTOR

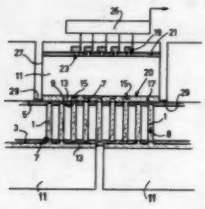
Walter H. Kühl; Johannes A. J. Van Leunen; Bart van der Eijk; Antonius J. J. M. van der Bolt, and Arthur M. E. Hoeberechts, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 885,670, Mar. 13, 1978, abandoned. This application Sep. 28, 1979, Ser. No. 79,909

Claims priority, application Netherlands, Mar. 28, 1977, 7703294

Int. Cl.³ H01J *9/12*

U.S. Cl. 445—35 **1 Claim**



1. A method for manufacturing a radiation detector of the type which comprises a photocathode which is disposed on an entrance window, an electron detector including a semiconductor junction, and means, including a perforated aperture plate disposed between the entrance window and the electron detector, which transmit electrons from the photocathode to the electron detector; comprising the steps of:

first assembly the entrance window and electron detector to the means which transmit electrons;

then covering one or more perforations in the aperture plate with removable spherical shield(s);

then forming the photocathode on the surface of the entrance window; and

then removing the spherical shield(s).

4,418,453

HEATING APPARATUS FOR SHRINK TUBING

Christopher K. Brown, Camp Hill, and Donald A. Wion, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 3, 1981, Ser. No. 239,967

Int. Cl.³ B27F *9/00;* **H01R** *43/00*

U.S. Cl. 29—33 M **3 Claims**

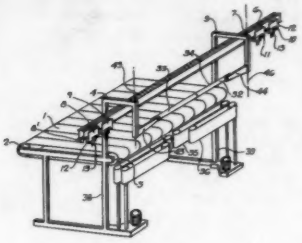
1. Apparatus for securing heat shrinkable tubing to the leading end of a wire comprises:

a duct having an open first end and an open second end, said duct having a first linear slot extending between said first end and said second end, said duct further having an aperture between said ends,

a hot air source positioned to provide hot air to said aperture into said duct,

a tube between said hot air source and said aperture, said hot air passing from said source through said tube to said aperture transversely of said slot,

conveyor means adjacent to said first linear slot, said conveyor means having gripping means for gripping said wire so that the leading end will extend axially into said duct



through said first linear slot, said conveyor means moving from said first end toward said second end so that said wire is conveyed laterally of its axis, whereby,

a wire having a piece of heat shrinkable tubing placed on the leading end can be gripped by said gripping means and conveyed by; said conveyor means with said leading end extending into said first linear slot and exposed to said hot air in said duct, thereby shrinking said heat shrinkable tubing onto said leading end.

4,418,454

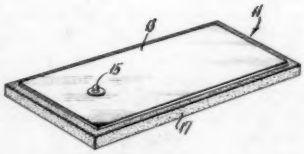
BURNISHING TOOTHED POWER TRANSMISSION MEMBERS

James T. Killop, Warren, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Continuation of Ser. No. 237,240, Feb. 23, 1981, abandoned. This application Mar. 25, 1983, Ser. No. 478,807

Int. Cl.³ B24B *39/00;* **B21H** *3/00*

U.S. Cl. 29—90 B **5 Claims**



5. A rack for burnishing toothed gears comprising: a unitary body of an elongated shape including leading and trailing ends and a toothed face extending therebetween; said unitary body including a flat mounting surface that faces in an opposite direction as the toothed face and also including a pair of side walls that face in opposite directions away from each other and extend in a perpendicular relationship from the mounting surface to the toothed face in a parallel relationship to each other; said toothed face of the unitary body including a leading section extending parallel to the mounting surface at the leading end of the rack; the toothed face also including an intermediate section that is slightly inclined with respect to the leading section and the mounting surface in a lateral direction along the elongated length of the body at a location between the leading and trailing ends thereof; and the toothed face also including a trailing section that is slightly inclined with respect

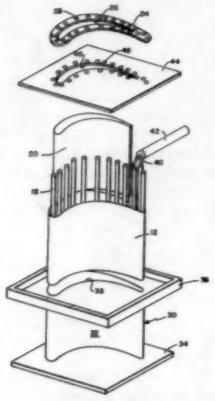
to the leading section and the mounting surface in a lateral direction along the elongated length of the body at the trailing end thereof and with an opposite inclination of the same angular extent as the intermediate section from the leading section.

4,418,455

METHOD OF MANUFACTURING A FLUID COOLED BLADE OR VANE

Arthur Cohn, Palo Alto, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 4, 1981, Ser. No. 259,997
Int. Cl.³ B23P *15/04*
U.S. Cl. 29—156.8 H **14 Claims**



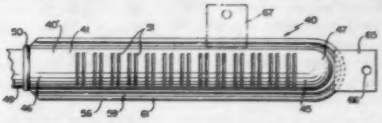
1. A method of making a fluid cooled blade or vane for use in a gas turbine or like apparatus, said blade or vane having an elongated spaced, open ended skin of predetermined cross-sectional configuration including open top and bottom ends, a plurality of spaced, open ended cooling tubes located within and extending in the elongated direction of said skin between the open ends of the latter and solid material filling said elongated skin around said tubes, said method comprising the steps of: initially providing said elongated skin as a preform; temporarily closing the bottom end of said preform; disposing said cooling tubes in their intended positions within said preform at lengths greater than the elongated length of the latter such that a top section of each tube extends beyond the opened top end of said preform whereby to prevent molten material from entering said tubes through their open top ends as said preform is filled with said material; initially providing said solid filling material in a molten liquid state; filling said preform around said tubes with said molten material while, at the same time, preventing said molten material from entering said tubes; causing said molten material to solidify; severing at least most of each top end section of said tubes after said preform has been filled with said material; providing an alignment plate having an array of through holes corresponding to the positional arrangement of the said tubes; placing the end sections of said tubes into aligned ones of said through holes before said preform is filled with said material whereby to hold said tubes in place; and removing said plate after said preform has been filled with said material.

4,418,456

TUBULAR BURNER CONSTRUCTION AND METHOD OF MAKING THE SAME

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 4, 1981, Ser. No. 318,031
Int. Cl.³ F23D *13/36*
U.S. Cl. 29—157 C **10 Claims**



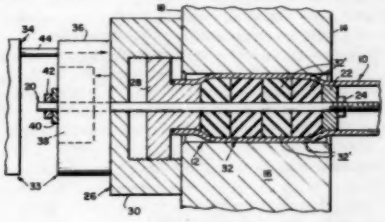
1. In a method of making a tubular burner construction having wall means defining a longitudinal fuel receiving chamber therein, said wall means having port means provided therein and leading from said chamber to the exterior of said burner construction for issuing fuel from said chamber, said wall means comprising two separate substantially like parts secured together at open ends thereof to define said tubular construction, the improvement comprising the steps of stamping each port from the same sized blank with a first pair of dies so that each part is initially substantially identical and has an outer peripheral flange means at said open end thereof, forming said port means with a second pair of dies in only one of said parts and inboard of said open end thereof while at the same time cutting away part of said flange means with said second pair of dies so that the peripheral flange means of said one part is shorter throughout its width than said peripheral flange means of the other of said parts, and securing said flange means of said parts together by turning said flange means of one of said parts over said flange means of the other of said parts and crimping said flange means together to seal said flange means to each other.

4,418,457

APPARATUS AND PROCESS FOR EXPANDING TO JOIN A TUBE INTO A TUBE SHEET OPENING

Richard A. Mueller, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed Jan. 21, 1982, Ser. No. 341,048
Int. Cl.³ B23P *15/26*; B21D *39/04, 39/08*
U.S. Cl. 29—157.4 **12 Claims**



1. An apparatus for radially expanding to join a tube into an opening of a tube sheet, including an inner face and outer face thereof, comprising:

(a) a tube mated within the tube sheet opening such that the majority of the length of the tube is exterior from and generally perpendicular to the inner face of the tube sheet;

(b) a shaft extending axially inside the tube;

(c) an inner end cap bound to one end of the shaft for longitudinal axial movement in combination with the shaft with respect to the tube;

(d) an inner collar cap slidably mounted on and along the

shaft in proximity with the tube sheet opening at the tube sheet outer face;

(e) an elastomeric means slidably mounted on and along the shaft within the tube sheet opening between the inner end cap and the inner collar cap for longitudinal axial movement on and along the shaft with respect to the tube;

(f) an outer locating collar abutting the outer face of the tube sheet in proximity with the tube sheet opening, said outer locating collar connected to the inner collar cap such that the inner collar cap may be substituted by other inner collar caps of different diameters, and such that the position of the inner collar cap may be adjusted within the outer locating collar along the longitudinal axis of the shaft; and

(g) a means for pulling the shaft in one axial direction while simultaneously pushing the outer locating collar in the opposite axial direction against the outer face of the tube sheet, such that when the inner end cap and the outer locating collar contact the elastomeric means the respective continuing axial forces .rom pulling and pushing compress the elastomeric means against the inside of the tube causing the tube to expand outwardly against the inner surface of the tube sheet opening to form an interference fit between the tube wall and the inner surface of the tube sheet opening.

7. A process for radially expanding to join a tube to an opening of a tube sheet, including an inner face and an outer face thereof, said process comprising the following steps:

(a) mating a tube within the tube sheet opening such that the majority of the length of tube is exterior from and generally perpendicular to the inner face of the tube sheet;

(b) aligning a shaft axially inside of said tube, said shaft having an inner end cap bound thereto for longitudinal axial movement in combination with the shaft with respect to the tube;

(c) mounting an elastomeric means slidably on and along the shaft within the tube sheet opening for longitudinal axial movement on and along the shaft with respect to the tube;

(d) mounting an inner collar cap slidably on and along the shaft in proximity to the tube sheet opening at the tube sheet outer face, said inner collar cap positioned on and along the shaft such that said elastomeric means is between said inner collar cap and said inner end cap;

(e) positioning an outer locating collar such that said outer locating collar abuts the outer face of the tube sheet in proximity with the tube sheet opening, said outer locating collar connected to the inner collar cap such that the inner collar cap may be substituted by other inner collar caps of different diameters, and such that position of the inner collar cap may be adjusted within the outer locating collar along the longitudinal axis of the shaft; and

(f) pulling the shaft in one axial direction while simultaneously pushing the outer locating collar in the opposite axial direction against the outer face of the tube sheet, such that when the inner end cap and the inner collar cap contact the elastomeric means the continuing respective axial forces from pulling and pushing compress and subsequently radially expand the elastomeric means against the inside of the tube, thereby causing the tube to expand radially against the inner surface of the tube sheet opening to form an interference fit between the tube wall and the inner surface of the tube sheet opening.

4,418,458

APPARATUS FOR MAKING PIPE COUPLING JOINT

John J. Hunter, 1410 Willow Pond, Abilene, Tex.

Division of Ser. No. 932,178, Aug. 9, 1978, Pat. No. 4,257,155, which is a continuation of Ser. No. 708,867, Jul. 26, 1976, abandoned. This application Nov. 18, 1980, Ser. No. 207,787

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—237 **2 Claims**

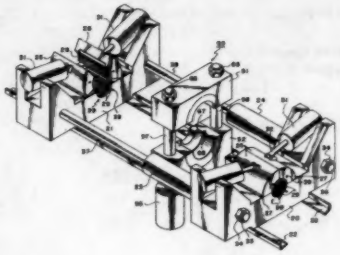
1. Apparatus for interference fit joining rigid malleable pipe sections comprising:

(a) means for holding a second pipe section in axial alignment with a first pipe section;

(b) means for holding said first pipe section in axial alignment with said second pipe section and simultaneously axially telescoping the end of said first pipe section within the end of said second pipe section; and

(c) means for deforming the mouth portion of said second pipe section radially inwardly to form an annular groove in said first pipe section and fit said mouth portion of said second pipe section within said annular groove, said means for deforming including:

(i) first and second semi-circular members adapted to form a circular ring when positioned adjacent each other,



said circular ring having a substantially smooth inner surface tapered from an internal diameter as large as the external diameter of said first pipe section to an internal diameter larger than the external diameter of the mouth of said second pipe section;

(ii) means for positioning said first and second semi-circular members adjacent each other and surrounding said first pipe section adjacent the mouth of said second pipe section; and

(iii) means for driving said circular ring axially over the mouth of said second pipe section sufficiently to radially deform said mouth inwardly, thereby forming an annular groove in said first pipe section and radially pressing said mouth into said groove.

4,418,459

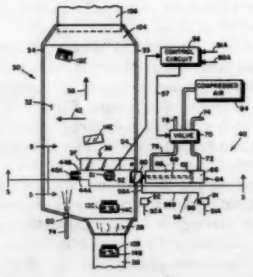
APPARATUS SEPARATING HYBRID SUBSTRATE FROM CARRIER PLATE

Gajendra M. Patel, Fremont, Calif., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Division of Ser. No. 129,507, Mar. 11, 1980, Pat. No. 4,360,960. This application Nov. 27, 1981, Ser. No. 325,418

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—239 **3 Claims**



1. Apparatus for separating a leaded hybrid substrate from a heat conductive carrier plate that it is sitting on, the flat bottom

of the substrate being contiguous with and stuck to the flat top surface of the plate by solder flux following a reflow solder operation, comprising:

first means for creating a first force on one of the substrate and plate for moving said one of the substrate and plate in one direction, said first force being in a plane substantially parallel to the contiguous surfaces; and

second means creating a second force on the other one of the substrate and plate for moving it in a direction generally opposite to the one direction so as to create a shear force in the one direction along the contiguous surfaces of the plate and substrate.

4,418,460

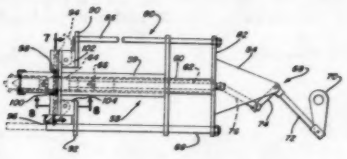
METHOD AND APPARATUS FOR SEPARATING A LID FROM A CONTAINER

Charles N. Ruth, 2414 Sandridge Ct., Grand Junction, Colo. 81503

Filed Aug. 11, 1981, Ser. No. 291,985

Int. Cl.³ B23Q *17/00*

U.S. Cl. 29—403.3 **12 Claims**



1. A method for removing a first end of a container, comprising the steps of:

entering a second end of the container; and

applying a force to the first end of the container in a direction inwardly to outwardly of the container to remove the first end of the container.

4,418,461

PROCESS FOR PRODUCING SLATS FOR A VERTICAL SLATTED VENETIAN BLIND

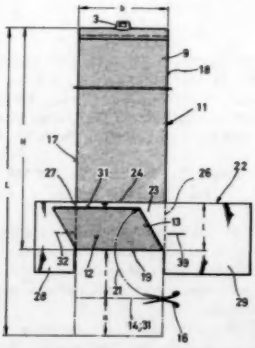
Horst Spohr, Cuxhaven, Fed. Rep. of Germany, assignor to Bautex Adolf Stover KG, Langen-Sievern, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,817

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1981, 3115832

Int. Cl.³ B23Q *17/00*; A41H *1/00*

U.S. Cl. 29—407 **5 Claims**



1. Method of producing ready-to-use slats from semifinished slat portions for use in a slatted Venetian blind having vertically directed slats, the semifinished slat portions being overlong, comprising the steps of cutting the free lower end of each semifinished slat to a predetermined length corresponding to the installation height plus an extra length equal to a wrap-over portion, folding the wrap-over portion at a bending edge, forming in the lower end portion of the slat in the vicinity of the wrap-over portion at least two holes, positioning retaining pins in said holes and subsequently locking said pins.

4,418,462

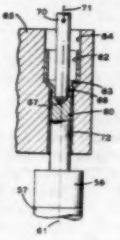
METHOD OF ASSEMBLING AND DISASSEMBLING A CONTROL COMPONENT STRUCTURE

Lewis A. Walton, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Division of Ser. No. 952,522, Oct. 18, 1978, abandoned. This application Jun. 26, 1981, Ser. No. 277,553

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—426.4 **5 Claims**



1. A method for installing and removing a burnable poison rod having a stem protruding from one end thereof from a spider having a bore for receiving the stem comprising the steps of inserting the stem in an axial direction into the spider bore, securing the stem in the bore, pressing the stem in the axial direction with respect to the bore with sufficient force to overcome the force securing the stem in the bore, and withdrawing the stem from the bore.

4,418,463

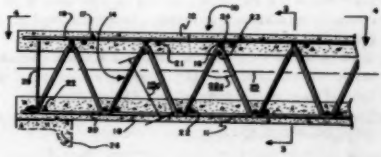
METHOD OF FABRICATING A COMPOSITE STRUCTURE OF CONCRETE AND STEEL METWORK

Robert C. McNeill, Ogden, Utah, assignor to Ogden Structural Products, Inc., Ogden, Utah

Continuation-in-part of Ser. No. 151,428, May 19, 1980, abandoned. This application Jan. 26, 1981, Ser. No. 228,581

Int. Cl.³ B22D *11/126*; B21F *15/08, 27/10*

U.S. Cl. 29—527.4 **2 Claims**



1. The method of fabricating a composite structure of concrete and steel network, comprising the steps:

providing a three dimensional wire network structure;

providing a first upwardly opening form, said form including members to provide a stiff structural assembly, and means pivotally supporting the assembly about a longitudinal axis thereof, so that the assembly may be rotated about said axis;

providing a first layer of high structural strength concrete

mix the length and breadth of the first upwardly opening form;

lowering the network structure into the mix in the form so that a portion of one side of said structure is submerged within the mix;

providing means supporting the three dimensional structure upwardly from the bottom of the form, so that the wires thereof are above the bottom of the first form;

providing means for clamping the first layer into the form upon the subsequent cure of said layer;

allowing a period of time for the first concrete layer to cure at least to initial hardness;

providing a second upwardly opening form with a second layer of high structural strength concrete mix the length and breadth thereof;

pivoting the stiffening structure over and supporting said structure so that a portion of the other side of the wire structure is submerged within the second concrete layer parallel to and above the bottom of the second form; and

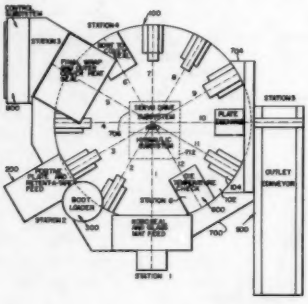
allowing a period of time for the second concrete layer to cure at least to initial hardness.

4,418,464

WRAPPING APPARATUS FOR INDUSTRIAL BATTERY PLATES

Hector DiGiacomo, Lafayette Hill, Pa.; Robert R. Raos, Freemont, Calif., and Al L. Zabko, Solon, Ohio, assignors to General Battery Corporation, Reading, Pa.

Filed Jul. 31, 1980, Ser. No. 174,151
Int. Cl.³ B23P *19/04;* H01M *2/14*
U.S. Cl. 29—564.6 **41 Claims**



1. An apparatus for doubly wrapping and enveloping a rectangular storage battery plate having bottom and side edges comprising:

fixture means for selectively receiving a battery plate;

first supply means for depositing a first swatch of an envelcping material on said fixture means;

second supply means for depositing a second swatch of a wrapping material on said fixture means such that said second swatch is on top of said first swatch;

means for depositing a wrapped and booted battery plate on said fixture means, including

means for laterally displacing a battery plate, bottom edge first, from a selected ready position;

third supply means for interposing a third swatch of a wrapping material in the path of lateral displacement of said battery plate such that the bottom edge intercepts the middle of said third swatch which is thereby wrapped about said battery plate; and

fourth supply means for interposing a selectively configured boot in the path of lateral displacement of said battery plate such that said boot envelopes the bottom edge of said battery plate wrapped by said third swatch;

means for wrapping said first and second swatches about the battery plate, including

means for tamping said plate into said fixture such that said first and second swatches conform to the side edges of said plate; and

means for folding said first and second swatches over said plate such that end portions of said first swatch overlap; and

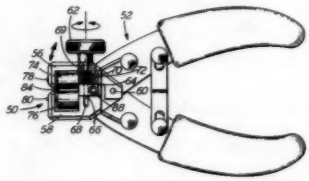
means for selectively bonding said boot and said first swatch so as to define an outer envelope which maintains said second and third swatches wrapped about said battery plate.

4,418,465

WIRE CUTTING AND INSULATION SOFTENING APPARATUS

Willard E. Rapp, Griggstown, N.J., assignor to Western Electric Co., New York, N.Y.

Division of Ser. No. 307,454, Oct. 1, 1981, Pat. No. 4,382,456.
This application Feb. 25, 1983, Ser. No. 469,664
Int. Cl.³ B23P *23/00*
U.S. Cl. 29—566.1 **5 Claims**



1. Apparatus for cutting and softening insulated wire comprising:

a pair of wire cutters;

means attached to the pair of wire cutters for softening the insulation of the wire comprising:

(a) a pair of opposed rollers; and

(b) means for mounting the rollers such that they are relatively movable away from one another to enable an insulated wire to be wrapped to be passed therebetween, and relatively movable towards each other for engaging and softening the wire insulation.

4,418,466

METHOD OF MAKING A LINEAR LIGHT-DETECTING DIODE INTEGRATED CIRCUIT

James R. Piedmont, Alexandria, and Michael Hacskaylo, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 27, 1981, Ser. No. 258,168
Int. Cl.³ H01G *9/06*
U.S. Cl. 29—572 **2 Claims**

1. The method of making a linear light-detecting diode array integrated circuit, including at least the steps of:

(a) preparing a linear array of diodes;

(b) preparing a substrate with resistors thereon corresponding to said diodes;

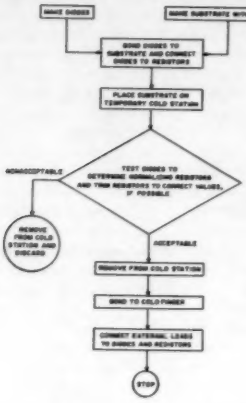
(c) mounting said array on said substrate and electrically connecting said resistors to corresponding diodes;

(d) placing said substrate on a temporary cold station;

(e) testing the light detectivity of said diodes to determine

normalization resistance values therefor, and trimming corresponding resistances to such values;

(f) removing said substrate from said cold station;



(g) bonding said substrate to a cold finger; and

(h) connecting external leads on said substrate and said cold finger.

4,418,467

SEMICONDUCTOR WAFER WITH ALIGNMENT MARKS AND METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

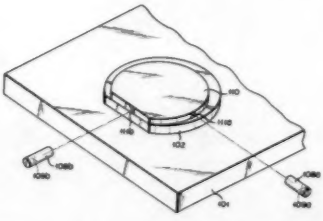
Hiroshi Iwai, Takaidonishi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 18, 1982, Ser. No. 390,031

Claims priority, application Japan, Jun. 26, 1981, 56-99358

Int. Cl.³ H01L *21/66*

U.S. Cl. 29—574 **12 Claims**



1. A method for manufacturing a semiconductor device, comprising the steps of: forming a numeral, letter, symbol or combination thereof as alignment marks on a side surface of a semiconductor wafer, aligning said semiconductor wafer with a unit apparatus for manufacturing said semiconductor device by utilizing said alignment marks, and processing said semiconductor wafer with said unit apparatus.

8. A semiconductor wafer with a numeral, letter, symbol or combination thereof as a mark formed on a side surface thereof for manufacturing a semiconductor device therefrom.

4,418,468

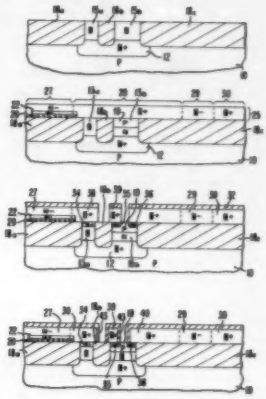
PROCESS FOR FABRICATING A LOGIC STRUCTURE UTILIZING POLYCRYSTALLINE SILICON SCHOTTKY DIODES

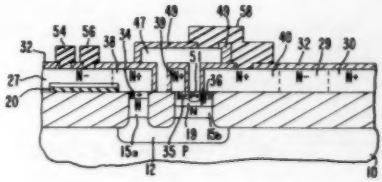
Madhukar B. Vora, Los Gatos, and Hermaj K. Hingarh, San Jose, both of Calif., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed May 8, 1981, Ser. No. 261,842

Int. Cl.³ H01L *21/20, 21/76*

U.S. Cl. 29—577 C **9 Claims**





1. A process for fabricating an integrated circuit comprising:

fabricating a pocket of semiconductor material surrounded by insulating material;

depositing a layer of a metal silicide on a first region of the insulating material;

depositing a first layer of semiconductor material on the layer of metal silicide; and

forming selected portions of a second layer of semiconductor material over at least a second region of the insulating material, the first layer of semiconductor material, and selected portions of the pocket, at least those portions of the second layer extending from the first layer to the pocket and from the pocket to the second region having higher impurity doping than that portion of the second layer overlying the second region.

4,418,469

METHOD OF SIMULTANEOUSLY FORMING BURIED RESISTORS AND BIPOLAR TRANSISTORS BY ION IMPLANTATION

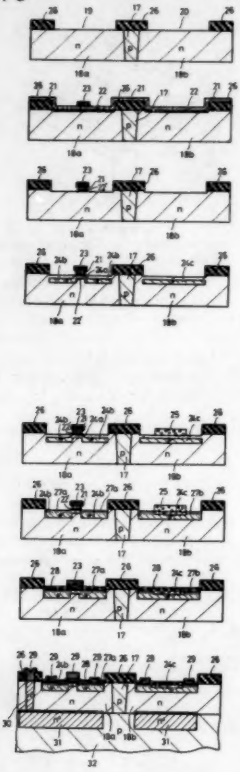
Tsutomu Fujita, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 137,462, Apr. 4, 1980, abandoned. This application Feb. 17, 1982, Ser. No. 349,532

Claims priority, application Japan, Apr. 12, 1979, 54-44927

Int. Cl.³ H01L *21/74*

U.S. Cl. 29—577 C **13 Claims**



1. A method of making semiconductor integrated circuit devices comprising, in combination, the successive steps of:

(A) forming a first and a second island regions of a first conductivity type,

(B) forming an emitter region of said first conductivity type selectively in said first island region,

(C) forming an active base region of a second conductivity type opposite to said first conductivity type under said emitter region, and a buried resistor layer of said second conductivity type in said second island region, said active base region and said buried resistor layer being formed simultaneously by an ion implantation with a first kind of ions of said second conductivity type from the surfaces of said first and said second island regions,

(D) forming a mask for subsequent ion implantation selectively on said buried resistor layer except on contact regions to be formed in said second island region, and thereafter

(E) forming non-active base regions so as to be in contact with said active base region, and said contact regions so as to be in contact with said resistor layer, said non-active base regions and said contact regions being formed simultaneously by another ion implantation with a second kind of ions of said second conductivity type and with a lower energy and a higher dose amount than the case of said ion implantation with said first kind of ions, from the surfaces of said first and said second island regions.

2. A method of making semiconductor integrated circuit devices comprising, in combination, the successive steps of:

(a) forming a first and a second island regions of a first conductivity type,

(b) forming an emitter region of said first conductivity type selectively in said first island region,

(c) forming a mask on said second island region except on contact regions for a buried resistor layer to be formed in said second island region,

(d) forming non-active base regions in said first island region, and contact regions in said second island region simultaneously by an ion implantation with a first kind of ions of a second conductivity type opposite to said first conductivity type, from the surfaces of said first and said second island regions,

(e) removing said mask, and thereafter

(f) forming an active base region under said emitter region so as to be in contact with said non-active base regions, and said buried resistor layer so as to be in contact with said contact regions, said active base region and said buried resistor layer being formed simultaneously by another ion implantation with a second kind of ions of said second conductivity type and with a higher energy and a lower dose amount than the case of said ion implantation with said first kind of ions, from the surfaces of said first and said second island regions.

4,418,470

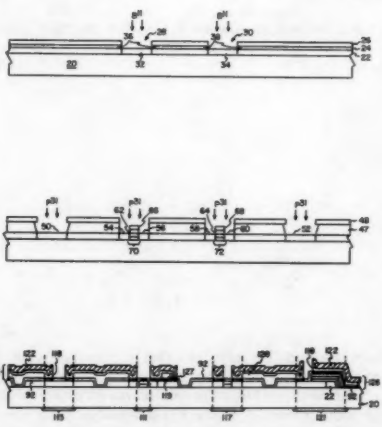
METHOD FOR FABRICATING SILICON-ON-SAPPHIRE MONOLITHIC MICROWAVE INTEGRATED CIRCUITS

Ronald J. Naster, Syracuse; Simon A. Zaidel, Liverpool; Ying-Chen Hwang, Liverpool; Earl L. Parks, Liverpool, and William R. Cady, Scotia, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Oct. 21, 1981, Ser. No. 313,378

Int. Cl.³ H01L *29/80, 27/02, 29/04*

U.S. Cl. 29—577 C **20 Claims**



1. A method of fabricating monolithic microwave integrated circuits comprising the steps of:

(a) simultaneously forming upon a wafer comprising a layer of silicon disposed upon a major surface of a sapphire substrate, a plurality of active, field effect transistor circuit

elements and a plurality of passive circuit elements with said layer of silicon; said step further comprising:

(1) forming a circuit element defining photoresist mask upon the surface of said wafer, said mask having openings therethrough to define the implant areas of predetermined active and passive circuit elements at exposed areas of said surface of said wafer;

(2) implanting a dopant of a particular electrical conductivity type and at a particular doping density into said exposed areas;

(3) removing said photoresist mask; and

(4) repeating steps (1), (2) and (3) for each desired implant of a particular desired dopant;

(b) removing selected portions of said layer of silicon to produce a plurality of electrically isolated islands containing at least one circuit element; and

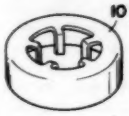
(c) depositing a plurality of metallization layers upon said wafer in a predetermined pattern to simultaneously form inductive circuit elements and circuit interconnections for said integrated circuit.

4,418,471

METHOD OF PRODUCING A STATOR YOKE OF A SMALL-SIZED MOTOR

Michihiro Torii, Hamamatsu, and Hiroaki Kobayashi, Toyohashi, both of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed May 27, 1981, Ser. No. 267,475
Int. Cl.³ H02K *15/02*
U.S. Cl. 29—596 **7 Claims**



1. A method of producing a stator yoke of a motor wherein said stator yoke has a multiplicity of polar teeth, comprising the steps of:

a. forming an intermediate blank so that said blank has an inner cylindrical portion and an outer cylindrical portion projecting in the same direction as said inner cylindrical portion,

b. cutting said inner cylindrical portion along an axial direction of said blank to form a multiplicity of polar teeth arranged at a constant pitch, said cutting being conducted by a cutting edge inclined at an acute angle relative to the axis of said blank, and

c. effecting a punching to deepen portions between bases of the adjacent polar teeth.

4,418,472

METHOD OF DELINEATING THIN FILM MAGNETIC HEAD ARRAYS

Robert V. Lorenze, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

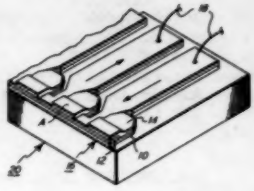
Filed Nov. 23, 1981, Ser. No. 324,195
Int. Cl.³ G11B *5/42*
U.S. Cl. 29—603 **7 Claims**

1. A method of forming thin film magnetic head arrays, comprising the steps of:

(a) preparing a single crystal silicon substrate having a surface with a (110) orientation and having a plurality of {111} planes intersecting said surface;

(b) fabricating a plurality of the thin film magnetic head arrays on the (110) oriented surface of said substrate, each array comprising a plurality of vertically configured, thin film magnetic head structures, each magnetic head structure in an array having a gap region aligned substantially in a one of said {111} planes, the gap regions of the magnetic head structures making up an array being substantially parallel with those of the other arrays on said substrate;

(c) forming a mask over the magnetic head arrays and exposed portions of said substrate, the mask having a pattern of openings, each opening exposing selected portions of each of said magnetic head structures making up an array and having an edge surface which lies in a selected {111} plane that is subsequently to include the array contact surface and the gap regions of the individual magnetic



head structures making up the array associated with that opening;

(d) ion beam milling the masked structure of step (c) along the selected {111} plane and at angles perpendicular to the (110) oriented surface of said substrate to etch through the exposed portions of said thin film magnetic head structures and into part of said substrate; and

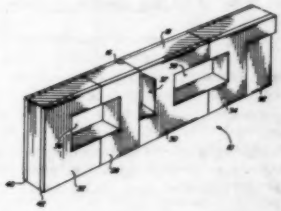
(e) anisotropically etching completely through the remainder of the milled substrate of step (d) along the selected {111} planes.

4,418,473

METHOD OF MAKING EDGE PROTECTED FERRITE CORE

Robert W. Burkhart, Tucson, Ariz.; Allen R. Cox, Chandlers Ford, and John D. Hartley, Winchester, both of England, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,425
Int. Cl.³ G11B *5/42*
U.S. Cl. 29—603 **16 Claims**



1. A process for making a ferrite core for a magnetic head comprising the steps of:

obtaining two very thin plate-like substrates respectively of a magnetic ferrite material and a non-magnetic ceramic material, each having a narrow edge circumscribing the substrate as a plurality of continuous edge surfaces and joining two outwardly facing plate-like surfaces;

edge bonding the obtained substrates to form a bonded ferrite core having a transducing gap intermediate the bonded substrates at an air bearing one of said edge surfaces of the just-formed bonded ferrite core;

placing at least one bonded ferrite core into a vacuum deposition system such that the plate-like surfaces of the bonded ferrite core are disposed perpendicularly to a

target of a film material to be deposited on the bonded ferrite core and keeping the plate-like surfaces spaced from any other item in the vacuum deposition system;

operating the deposition system such that a film layer of the target material is simultaneously deposited on all exposed surfaces of said placed substrates including said plate-like surfaces of said ferrite core; and

removing the substrates from the system after the desired film thickness is obtained from said operated system.

4,418,474

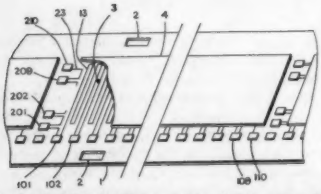
PRECISION RESISTOR FABRICATION EMPLOYING TAPPED RESISTIVE ELEMENTS

William P. Barnett, 744 Pelleas La., San Jose, Calif. 95127

Continuation-in-part of Ser. No. 114,144, Jan. 21, 1980, abandoned. This application Jun. 25, 1980, Ser. No. 162,963

Int. Cl.³ H01C *7/02*

U.S. Cl. 29—612 **36 Claims**



1. A method of fabricating a resistor having a predetermined value of resistance within a precisely-predetermined tolerance range, comprising the following steps:

(a) providing an elongated resistive element having a plurality of contact pads thereon, said pads having predetermined spacings along said element so as to divide said element into resistive segments, said resistive element constituting a first layer of resistive material, the portions of said first layer which constitute said control pads being covered by a second layer, said second layer being of a material which is different from that of said first layer and which is capable of being bonded to a connecting wire, said segments each having a resistance value which is less than said tolerance range,

(b) measuring the resistance of a known number of segments from 1 to m, where m is a whole number, of said resistive segments,

(c) calculating the number of said resistive segments necessary to attain said predetermined value of resistance, within a tolerance range equal to the value of resistance of one of said resistive segments, using as a basis the measured resistance of said known number of resistive segments,

(d) indentifying a pair of said contact pads which are connected across said claculated number of resistive segments, and (e) connecting conductors to the pads so identified.

4,418,475

METHOD OF MANUFACTURING A PRINTED CIRCUIT CARD EDGE CONNECTOR HAVING A PULL THROUGH BELLOWS CONTACT A LAY-OVER INSULATOR

J. Preston Ammon; Harry R. Weaver, both of Dallas, Tex., and Richard O. Norman, Oxnard, Calif., assignors to Elfab Corporation, Dallas, Tex.

Division of Ser. No. 95,226, Nov. 19, 1979, Pat. No. 4,324,451. This application Apr. 8, 1982, Ser. No. 366,654

Int. Cl.³ H05K *3/00*

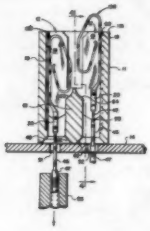
U.S. Cl. 29—842 **9 Claims**

1. A method for manufacturing a printed circuit card edge connector comprising the steps of:

providing an insulative substrate having a plurality contact receiving holes therein, said holes forming arrays lying along linear paths;

providing an insulative block having a plurality of pull through sleeves each including a pair of parallel, laterally spaced alignment troughs comprising an alignment track;

providing a plurality of contacts each having an upper contactor region, an intermediate mounting portion, a lower tail portion, and a pair of laterally extending projections adapted for engagement with and being received into the alignment troughs in said insulative block, said contacts each including intermediate press fit mounting regions and being connected to a common support strip;



inserting a plurality of contacts interconnected by a common support strip into the top openings of said sleeves;

positioning said laterally extending projections of said contacts in said insulative housing alignment troughs with said contact tails extending out the bottom openings of said sleeves in axial alignment relative one to the other;

removing the common support strip;

inserting the contact tails through the contact receiving apertures in the insulative substrate; and

applying a longitudinal force to the tails of the contacts to press fit, and thereby rigidly mount, the contacts into the apertures in the substrate.

4,418,476

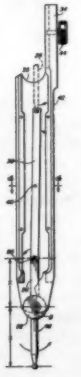
OFFSET INDICATOR EXTENSION

Heinz E. Missun, 7824 Via del Mundo, Scottsdale, Ariz. 85258

Filed Feb. 1, 1982, Ser. No. 344,319

Int. Cl.³ G01B *3/22*

U.S. Cl. 33—172 B **11 Claims**



1. An apparatus for extending the reach of an offset indicator tool of the type which includes an offset indicator dial, a first pivotably mounted needle, and a mechanism for converting

movements of said first needle into indications on said dial, said apparatus comprising:

a housing;

a linking member pivotably coupled within said housing and having a first end for cooperatively engaging said first needle so as to transmit movements of said linking member to said first needle;

a lever pivotably mounted about a first point on said housing and having an upper end for cooperatively engaging a second end of said linking member so as to transmit movements of said lever to said linking member; and;

a second needle pivotably mounted about said first point on said housing and in frictional engagement with said lever such that movements of said second needle are transmitted to said lever.

4,418,477

MEASURING TAPE

John R. Montgomery, Toledo, Ohio, assignor to Jobst Institute, Inc., Toledo, Ohio

Filed May 18, 1981, Ser. No. 264,862
Int. Cl.³ G01B *3/10*
U.S. Cl. 33—179 **1 Claim**

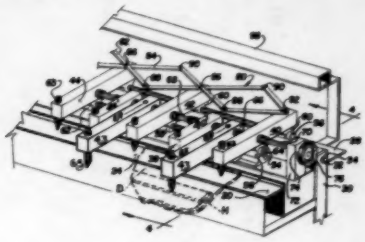
1. A measuring device comprising a strip of flexible non-elastic sheet material having a given maximum width along a first portion thereof extending from one free end to a second end attached to one end of a second portion of said strip, said second portion including an opposite free end and having a central longitudinal region and two adjacent side regions, said second portion having a second width greater than said given maximum width such that said side regions are foldable longitudinally of said strip so as to cover said central longitudinal region on one face thereof and to form a slide to receive said first portion of said strip of said given maximum width, said first portion being calibrated on said one face in indicia of longitudinal dimensions, said second portion having aperture means formed in said central longitudinal region and indexing means on an opposite face of said central longitudinal region for cooperating with said indicia of longitudinal dimensions to define said indicia characterizing the length of said strip extending from said slide toward said one free end and returned to said slide adjacent said second end of said first portion.

4,418,478

DRAPERY PLEAT AND FOLD LINE MARKING MACHINE

Ronald W. Morgan, 6311 Lime Rd., Louisville, Ky. 40222

Filed Jun. 1, 1981, Ser. No. 268,911
Int. Cl.³ B43L *9/08*
U.S. Cl. 33—192 **9 Claims**



1. A drapery pleat marking and fold marking machine comprising:

A. a supporting base member;

B. a first adjustable mechanism for marking a first series of spaces on a drapery panel;

C. a second adjustable mechanism for marking a second series of spaces between the first series of spaces;

D. said first adjustable mechanism comprising a series of equally spaced pairs of bars, slidably mounted on elongated slide means; each pair of bars being joined by an adjustable connecting means, and an elongated drive means in operative relation with said adjustable connecting means of each pair of bars; said drive means co-acting with said adjustable connecting means to adjust the space between each of the bars of each pair of bars in a uniform manner; said adjustable connecting means being longitudinally slidable on the elongated drive means;

E. a third series of bars, equidistantly mounted in fixed relation between each pair of equally spaced bars for making a third series of marks on the drapery panel;

F. said second adjustable mechanism comprising adjustable interconnecting means serving to vary the distance between each pair of bars in a uniform, equally spaced manner; and

G. marking means provided on each bar and adapted to engage the drapery panel for marking off the several series of spaces.

4,418,479

VARIABLE RANGE SIGHTING MECHANISM FOR USE WITH ARCHERY BOW

John Stachnik, R.D. #2, Box 166, Susquehanna, Pa. 18847

Filed Sep. 27, 1978, Ser. No. 946,195
Int. Cl.³ G01C *15/12*; F41G *1/46*
U.S. Cl. 33—265 **4 Claims**

1. A sighting mechanism for use with an archery bow, comprising:

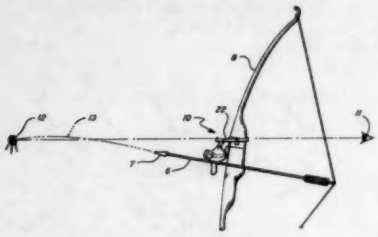
a mounting plate for mounting said sighting mechanism to said bow;

a sight bar having a front sight mounted on a forward portion thereof and a rear sight mounted on a rear portion thereof being adapted to be adjustable in one or more degrees of freedom;

means for attaching said sight bar to said mounting plate; and

elevation adjustment means connected to said mounting plate and to said sight bar for adjusting the elevation of said sight bar with respect to said mounting plate for accurate shooting at one or more predetermined distances, said elevation adjustment means comprising a plate attached at a first point to said sight bar and at a second

point pivotably mounted to said mounting plate and having a plurality of predetermined detent positions represen-



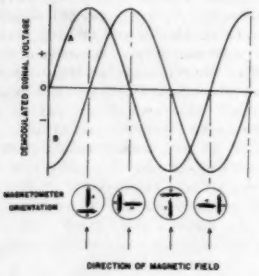
tative of preselected shooting distances for adjusting the angle of elevation of said sight bar.

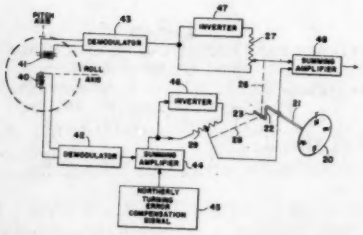
4,418,480

MAGNETIC HEADING REFERENCE

H. Douglas Garner, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 9, 1982, Ser. No. 367,187
Int. Cl.³ G01C *17/30*
U.S. Cl. 33—349 **20 Claims**





1. A device for generating a signal indicative of the difference between the actual heading and the selected heading of a vehicle comprising:

first and second magnetometers mounted on the vehicle in a horizontal plane during normal movement of the vehicle and with the sensing elements of the magnetometers at an angle with each other;

first demodulating means for demodulating the output of said first magnetometer;

first inverter means for inverting the output of said first demodulating means;

second demodulating means for demodulating the output of said second magnetometer;

second inverter means for inverting the output of said second demodulating means;

a dial calibrated in the points of a compass for selecting the heading of the vehicle;

means receiving the outputs of said first demodulating means and said first inverter means and under the control of said dial for generating a sin signal proportional to the output of said first demodulating means times the sin of the angle through which said dial is rotated;

means receiving the outputs of said second demodulating means and said second inverter means and under the control of said dial for generating a cos signal proportional to the output of said second demodulating means times the cos of the angle through which said dial is rotated; and

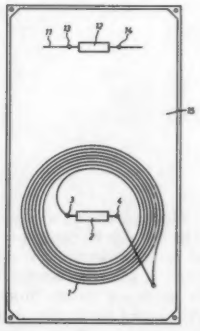
means for summing said sin signal and said cos signal to produce said signal indicative of the difference between the actual heading and the selected heading of the vehicle.

4,418,481

APPARATUS FOR THE DEHUMIDATION AND DRYING OF DAMP STRUCTURES

Walter Wehrli, Hotel Bahnhof, Urnäsch, Switzerland

Filed Oct. 14, 1980, Ser. No. 196,881
Int. Cl.³ F26B *23/04*
U.S. Cl. 34—1 **8 Claims**



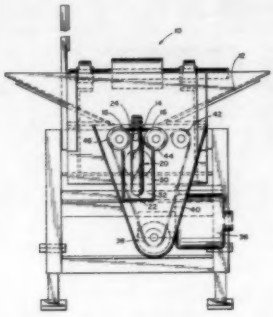
1. An apparatus for the dehumidation and drying of damp structures, comprising a first spirally wound flat electric coil connected at each end to a respective terminal of a first condenser and comprising further a second spirally wound flat electric coil connected at each end to a respective terminal of a second condenser, the plane defined by said first coil extending perpendicularly to the plane defined by said second coil, said apparatus being mounted substantially adjacent to said damp structure to be dried wherein said apparatus generates an electric field which is in opposition to that naturally occurring in the damp structure, said generated electric field acting to force moisture from said damp structure.

4,418,482

DEVICE AND METHOD FOR FEEDING HOT ARTICLES TO PREVENT MUTUAL ADHERENCE THEREOF

Samuel S. Aidlin, 50-79 Village Garden Dr., Sarasota, Fla. 33580, and Stephen H. Aidlin, 7442 Vanderipe Rd., Sarasota, Fla. 33583

Filed Sep. 30, 1982, Ser. No. 430,709
Int. Cl.³ F26B *7/00, 25/02*
U.S. Cl. 34—20 **4 Claims**



1. A device for feeding hot articles, particularly pre-molded blanks, each having a ring collar, comprising in combination

a pair of rollers spaced a predetermined distance smaller than the diameter of said ring collar from one another for transporting the hot articles one after the other in a predetermined direction, said rollers being rotatable in opposite directions along respective axes of rotation thereof,

a substantially closed plenum located under said rollers, and extending in an axial direction substantially over the entire length of said rollers,

blower means arranged to positively direct cooling air toward the hot articles during their transportation so that the cooling air flows around the articles to cool said articles, and to prevent mutual adherence of the hot articles to one another,

said rollers each having an outer surface provided with a helical groove for engaging and holding the ring collar of each of said articles during transportation of said hot articles so as to move said articles in a translatory manner only along the axial direction along said rollers and inside said plenum located under said rollers, said helical groove having dimensions similar to that of a phonograph groove formed on a phonograph roller.

4,418,483

METHOD OF MANUFACTURING SHOE SOLE MATERIAL AND SHOES PRODUCTS MADE BY THE SAME

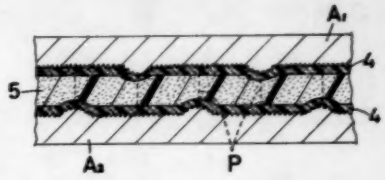
Minoru Fujita, 8-banchi, 2 chome, Kouryo-cho, Kita-ku, Kobe-shi, Hyogo-ken, Japan, and Shigeo Nishida, Hyogo, Japan, assignors to Rinzai Co., Ltd., Hyogo, Japan, by said Shigeo Nishida

Filed Mar. 31, 1981, Ser. No. 249,451
Int. Cl.³ B29D *27/00;* **A43B** *13/18, 13/12;* **B32B** *5/20*
U.S. Cl. 36—28 **13 Claims**

1. A method of manufacturing shoe sole material, which comprises:

superposing a first sheet for a midsole layer on a second sheet for an outsole layer in a mold having a pattern formed on at least the mold surface in contact with said second sheet, said first sheet comprising a synthetic resin, a crosslinking agent and a foaming agent, said second sheet comprising a synthetic resin, a crosslinking agent and a foaming agent, said first and second sheets having different foamability ratios and being capable of being fused together under heat; and

hot-pressing said superposed first and second sheets in said mold to foam at least said first sheet and form crosslinkages in and between said first and second sheets to fuse said first and second sheets together.



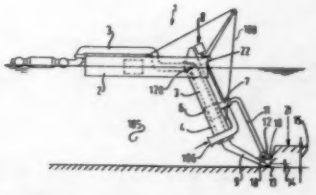
6. A shoe product containing the shoe sole material manufactured according to the method of claim **1**.

4,418,484

METHOD OF DREDGING AND DREDGING IMPLEMENT

Tjako A. Wolters, Zeist; Gerard W. H. Goedegebuure, Amstelveen; Bartholomeus M. de Witt, Amsterdam, all of Netherlands, and Constantius H. M. Veltman, Safat, Kuwait, assignors to Ballast-Nedam Groep N.V., Amstelveen; Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V. and Scheepswerf en Machinefabriek "De Liesbosch" B.V., Nieuwegein, all of, Netherlands

Filed Dec. 1, 1980, Ser. No. 211,925
Claims priority, application Netherlands, Nov. 15, 1979, 7908362; European Pat. Off., Nov. 29, 1979, 79200703.1
Int. Cl.³ E02F *3/88*
U.S. Cl. 37—63 **10 Claims**



1. The method of removing a selected top layer of subaqueous material while leaving the material underlying such layer in essentially undisturbed condition, which comprises the steps of:

(a) providing a suction inlet mouth of elongate, flattened form and traveling such mouth along a particular path which is overburdened by the top layer of subaqueous material to be removed,

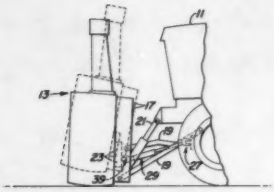
(b) forcibly directing water ahead of the suction inlet mouth in the direction of travel thereof and during the traveling of step (a), and

(c) controlling the direction and the energy of the water directed in step (b) to fluidize substantially only the material of said top layer and thereby leave a well defined and smooth surface of the underlying material which is parallel to said path.

4,418,485
SNOWBLOWER GEARBOX ASSEMBLY

Kenneth E. Herren, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed Mar. 29, 1982, Ser. No. 362,732
Int. Cl.³ E01H 5/09
U.S. Cl. 37—244 2 Claims

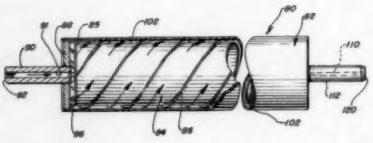


1. In combination, a snowblower having a housing containing a rotatably mounted collector and impeller and gear box drivingly communicating with said collector and impeller, said gear box comprising a casing having at least a first and second section fixably and detachably mounted to each other defining a chamber, said housing having a rear wall containing a plurality of mounting stations mating to said casing such that said casing can be fixably and detachably mounted to any one of said mounting stations, an input shaft rotatably mounted in said casing having a portion extending therefrom and carrying a fixably and detachably mounted first gear within said chamber, an output shaft rotatably mounted in said casing having a portion extending therefrom in driving communication with said collector and impeller, said output shaft carrying a fixably and detachably mounted second gear in driven communication with said first gear.

4,418,486
HEATED SMOOTHING ROLL

Kasimir Kober, Niles, Ill., assignor to Chicago Dryer Company, Chicago, Ill.

Filed Oct. 27, 1981, Ser. No. 315,685
Int. Cl.³ D06F 61/06, 67/02
U.S. Cl. 38—58 6 Claims

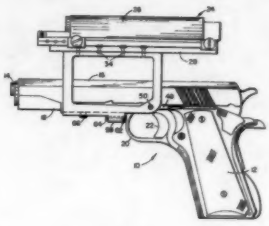


1. An ironing apparatus comprising a first rotatable cylinder adapted to have laundry articles urged into engagement with the periphery thereof for effecting an ironing operation; an inner cylinder rotatable as a unit with said first cylinder and mounted within said first rotatable cylinder with the longitudinal cylinder axes substantially coincident so as to define an inner chamber having open ends and disposed in said first cylinder; said chamber being defined by said inner cylinder outer periphery and said first cylinder inner periphery and providing a passageway through which a heated thermal liquid may pass along the length of said first cylinder; said inner chamber being substantially liquid-tight between the open ends thereof; first liquid conduit means for passing a heated thermal liquid into one end of said inner chamber, and second liquid conduit means for removing heated thermal liquid at the opposite end of said inner chamber; helical blade means disposed in said inner chamber between the open ends thereof for impelling heated thermal liquid between said first conduit means and said second conduit means during the normal rotation of the rotatable cylinders; said inner cylinder being of substantially uniform cross-section and said helical blade means being substantially uniformly arranged along the length of said inner chamber between the open ends thereof.

4,418,487
MOUNTING BRACKET FOR GUNSIGHT

Travis R. Strahan, Rte. 7, Townsend Cir., Ringgold, Ga. 30736

Filed Feb. 2, 1982, Ser. No. 345,083
Int. Cl.³ F41G 1/38
U.S. Cl. 42—1 ST 8 Claims



1. A mounting bracket for mounting a scope-type sight on a handgun, said handgun having a frame, a barrel supported on the frame, a handle disposed angularly relative to the barrel remote from the discharge end of the barrel, said frame including a trigger guard disposed about a trigger spaced below the barrel adjacent the handle, said bracket comprising a substantially rectangular housing having a channel extending longitudinally therethrough from a first end to a second end to define a spaced pair of side walls, a top wall and a bottom wall, said channel being of a size for receiving at least the barrel and a portion of the frame, said top wall including a planar exterior surface for supporting said sight, said bottom wall extending from the first end of the housing and having a terminus spaced from the second end, said bottom wall including an interior surface having a shape conforming substantially to that of said frame adjacent the trigger guard, each side wall having a bore intermediate said terminus and said second end, the bore in one side wall being aligned with the bore in the other side wall for receiving a pin extending from one bore to the other, a protuberance disposed on the exterior surface of said bottom wall and having a terminal surface substantially at said terminus, and adjustable stop means carried by said protuberance for extension from said terminal surface, whereby said mounting bracket may be supported on the frame by positioning said pin through said frame and securing said stop means against said trigger guard.

4,418,488
PISTOL AND REMOVABLE CARTRIDGE SHAPED BARREL INSERT

Jack Hughes, P.O. Box 275 Thrall Rd., Ellensburg, Wash. 98926

Filed Oct. 2, 1981, Ser. No. 307,741
Int. Cl.³ F41C 3/00, 21/10, 21/22
U.S. Cl. 42—75 B 11 Claims

1. A pistol body for releasably receiving a cartridge barrel in the form of a large bore cartridge, comprising:

a frame having a handle with a trigger and hammer housing at one end;

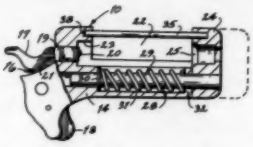
said frame having a muzzle nose piece at a remaining frame end;

a laterally open barrel receiving depression formed in the frame between the trigger and hammer housing, and the muzzle nose piece, adapted to receive the cartridge barrel;

a firing pin mounted within the frame adjacent the barrel depression, said firing pin being movable within the frame along a central axis;

a hammer and trigger mechanism within the housing on the frame, a trigger being selectively operable to actuate a hammer to strike the firing pin and move it axially toward the barrel receiving depression;

wherein the muzzle nose piece is spaced axially forward of the firing pin, and is axially movable on the frame to



receive and secure a cartridge barrel within the barrel receiving depression; and

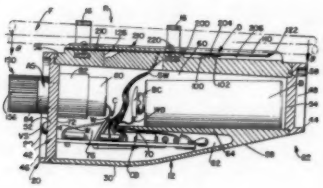
biasing means operatively connecting the muzzle nose piece and the frame for yieldably urging the nose piece axially toward the firing pin to yieldably press a cartridge barrel against the trigger and hammer housing with the cartridge barrel centered axially on the central axis of the firing pin.

4,418,489

STRIKE SIGNALLING APPARATUS FOR A FISHING ROD

William R. Mathauser, 3000 "B" Ave., Anacortes, Wash. 98221

Filed May 26, 1981, Ser. No. 266,979
Int. Cl.³ A01K *97/12*
U.S. Cl. 43—17 **20 Claims**



1. A device for use in fishing comprising:

self-contained means mountable on different fishing rods of various types and sizes for signalling when a fish has struck including as follows;

a housing detachably mounted on a fishing rod at a selected position;

attaching means detachably mounting said housing on the fishing rod;

fishing rod deflection monitoring means directly mounted on said housing and including a strain gauge; and means contacting the fishing rod and transferring fishing rod deflection to said strain gauge in a manner which causes said strain gauge to react to such rod deflection and said strain gauge being mounted on said rod contacting means;

alerting means to be activated by said strain gauge when a predetermined amount of fishing rod deflection has occurred; and

circuit means connecting said alerting means to said strain gauge and to a power source;

said housing protecting said deflection monitoring means from environmental conditions which may cause said monitoring means to inconsistently sense rod flexure.

4,418,490

FISH BAIT PROTECTOR

Frank A. Ancona, 5424 N. Tracy, Kansas City, Mo. 64118

Filed Mar. 11, 1982, Ser. No. 356,942
Int. Cl.³ A01K *97/06*
U.S. Cl. 43—25.2 **6 Claims**

1. A fish bait protector comprising:

a. a pair of separable panels each having a flexible, waterproof outer cover layer, and an inner liner layer, confronting the other of said panels, formed of a resiliently compressible porous material capable of absorbing and retaining a substantial quantity of water, and

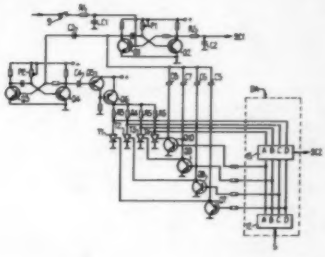
b. fastening means operable to join the edge portions of said panels firmly but separably together around substantially the entire peripheries of the separable edges of said panels, whereby to form a seal inhibiting both the exit of water from between the panels and the circulation of air between said panels.

4,418,491

AUTOMATIC ANGLING MACHINE

Thorbjorn Christiansen, N-8400 Sortland, Norway

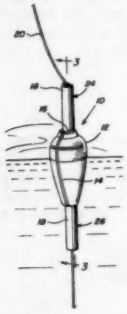
Filed Jul. 9, 1979, Ser. No. 56,063
Claims priority, application Norway, Jul. 13, 1978, 782433
Int. Cl.³ A01K *89/017*; B66D *1/48*
U.S. Cl. 43—26.1 **2 Claims**



1. In an automatic angling machine comprising a machine housing, a line reel rotatably mounted on said housing for winding and unwinding of fishing line, an electric motor for driving said line reel, an electromagnetic clutch, control circuits for controlling operation of said motor and said clutch in a prescribed manner to effect a plurality of fishing functions of the machine, a switch operating member operatively coupled to said fishing line, an automatic depth control circuit, and a switch actuated by movement of said operating member for activating said clutch, the improvement comprising: an improved switch operating member including a rocker arm pivotably mounted on said housing to function as a double-armed lever, said rocker arm being pivotable from a first position to a second position, the free end of one arm constituting a hoop placed over said fishing line issuing from said line reel, the free end of the other arm arranged to actuate said switch when the hoop end pivots from said first position to said second position when the line is in a slack condition, said operating member, by

its operative coupling with said line, being maintained in said first position and prevented from actuating said switch when the line issuing from said ine reel is in a taut condition; a plurality of counters and comparators in said depth control circuit for controlling operation of said motor and clutch to effect prescribed ones of said fishing functions of the machine in independence on correspondence between a set fishing depth and the counts of a plurality of said counters indicating the fishing depth; and, between said switch and said clutch and motor, an electronic circuit which, during line discharge in progress, causes actuation of said motor to effect a hauling function of the machine for a first preset period of time by the closing of said switch, and which is arranged to cooperate with said automatic depth control circuit to effect a normal fishing mode function of the machine for a second preset period of time, and thereafter cause repeated line discharge until another closing of said switch.

4,418,492
FISHING FLOAT
Sam E. Rayburn, P.O. Box 704, Loveland, Colo. 80537
Filed Jul. 27, 1981, Ser. No. 286,900
Int. Cl.[3] A01K *93/00*
U.S. Cl. 43—44.9 **3 Claims**

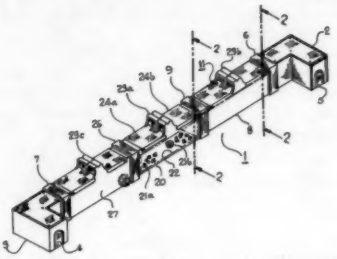


1. A new and improved slip-type fishing float for use on a fishing line, said float comprising:

float body means of a buoyant construction having a substantially centrally positioned, axially extending bore and further having a first slit extending radially outwardly from said bore and being in communication therewith; and

slit tube means positionable within said bore and having a second slit associated therewith, said slit tube means being substantially frictionally retained within said bore and being selectively manually rotatable therein so as to selectively effect alignment and misalignment of said first and second slits as desired, said fishing line being directable through said first and second slits into said bore when said first and second slits are aligned and then being retained within said float body means by a manual rotation of said slit tube means so as to effect a misalignment of said first and second slits, at least one lock means for effecting a snag-free attachment of said slip-type fishing float to said fishing line, said lock means being operably attachable to said slit tube means so as to effect said snag-free attachment of said slip-type fishing float to said fishing line, said lock means including a central bore and outwardly extending appendages with said fishing line being positionable between said appendages into said central bore and being securely retained therein to effect a slidable securing of said fishing float to said fishing line, said appendages extending outwardly through said second slit contained in said slit tube means, said appendages being forced together when so positioned within said second slit, thereby to effectively prevent said fishing line from passing out of said central bore.

4,418,493
MODULAR ANIMAL TRAP
Carmel T. Jordan, 1040 Grandview Ave., Union, N.J. 07083
Filed Nov. 23, 1981, Ser. No. 323,958
Int. Cl.[3] A01M *23/20*
U.S. Cl. 43—67 **10 Claims**



1. A trapping device for capturing animals which comprises in combination:

one or more modular units comprising a first substantially rigid hollow structure having a base portion, top and side walls, assembled to provide a continuous runway for said animals which is closed except for one or more ingress areas initially open and large enough to admit one of said animals;

at least one gate;

a pair of curved tracks disposed on opposite inner walls of said first rigid hollow structure;

said gate mounted to ride to-and-fro along said tracks internally in said rigid hollow structure from said initial open position in which the principal plane of said gate is adjacent the floor of said first hollow structure near said ingress area to a closed position in which said gate is interposed transversely across said ingress area, completely closing said ingress area;

spring-biasing means connected between said gate and a point inside said rigid hollow structure in the area in which said animal is to be confined to urge said gate from open to closed position;

and means comprising a treadle in said rigid hollow structure in the path of an entering animal, beyond said ingress area, said treadle constructed and arranged to trigger said spring-biasing means to urge said gate to move along said tracks from said open to said closed position, for preventing said animal from escaping through said ingress area;

wherein said first hollow structure includes in the top wall thereof a slot intermediate the ends of said structure, a first latching means including detent means disposed on the exterior of said top wall adjacent said slot, said detent means being constructed and arranged to be inaccessible to the area in which said animal is confined and to said ingress area, and said detent means responsive to operate upon impact by the leading edge of said spring-biased gate when said leading edge passes through said slot to engage and secure said gate in closed, latched position.

4,418,494

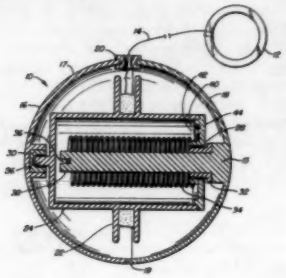
RETURNING BALL TOY

Edmond Ghandour, 2636 Stuart St., Berkeley, Calif. 94705

Continuation of Ser. No. 923,155, Jul. 10, 1978, abandoned. This application Jan. 14, 1981, Ser. No. 225,133

Int. Cl.³ A63H *27/12*

U.S. Cl. 46—61 **6 Claims**



1. A toy, comprising:

(a) a hollow rotatable hub member;

(b) a reel mounted on the hub member;

(c) a rigid housing containing said hub member and reel;

(d) a fixed axle rigidly mounted in the housing and supporting the hub member for relative rotation with respect to the housing, said axle having a free end located within the hub member;

(e) a torsion spring located within the housing and having two ends, one end being operatively attached to the housing and the other end attached to the hub member so that relative rotation between the hub member and the housing is resisted by tension in the spring; and

(f) a flexible cord having a first end attached to the reel and a second free end passed through the housing, said cord being adapted for being coiled about the reel so that when the cord is moved, the reel and hub member rotate about the axle relative to the housing, resisted by the tension in the spring.

4,418,495

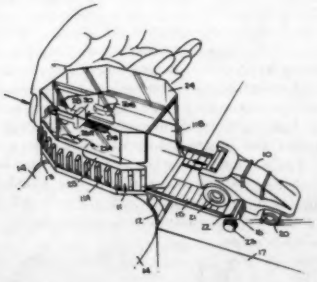
MINIATURE RACING VEHICLE AND WRIST-BORNE LAUNCHING PLATFORM ASSEMBLY

Melvin R. Kennedy, Hampton Bays, N.Y., and Dietmar Nagel, Chester, N.J., assignors to Buddy L Corporation, New York, N.Y.

Filed Feb. 3, 1982, Ser. No. 345,475

Int. Cl.³ A63H *11/10*

U.S. Cl. 46—206 **10 Claims**



1. A toy assembly comprising:

A. a spring motor-powered vehicle having a wind-up knob secured to a stem projecting laterally from the vehicle;

B. a platform strappable onto the wrist of a player and including a retractable ramp extending from the front end thereof;

C. a transparent cover affixed to the platform to define a hangar having an open front to accommodate the vehicle with its front end facing the hangar opening, the hangar having a side slot to admit the stem, whereby the wind-up knob is outside the hangar and accessible to the player, said hangar being provided with holding elements which frictionally engage the sides of the vehicle to resist withdrawal thereof; and

D. a push-button actuator mounted on the rear of the hangar and having a pusher abutting the rear end of the vehicle whereby when the push-button is pressed in, the pusher advances the vehicle to free it from the holding elements, whereby the vehicle can then run down the extended ramp onto a playing surface.

4,418,496

SUPPORT STRUCTURE FOR SMALL FLORAL ARRANGEMENT

Arnold A. Koistinen, Watertown, S. Dak., assignor to Dakota Plastics Company, Watertown, S. Dak.

Filed Aug. 25, 1982, Ser. No. 411,863

Int. Cl.³ A01G *5/00*

U.S. Cl. 47—41.12 **10 Claims**

1. Support structure for small floral arrangements for use during occasions such as weddings and the like, the support structure comprising grasping means for mounting upon a member having two vertical sides and a horizontal surface transversely of the two vertical sides, the grasping means adapted for resting upon the horizontal surface and to biasingly engage each of the two vertical sides, the grasping means including an elongated sheet of resilient material embodying a generally straight elongated and inclined intermediate portion, a vertical depending first portion extending downwardly from the upper end of said inclined portion, a second portion on the lower end of said inclined portion and joined thereto by an arcuate integral connecting portion, the first vertical depending portion being generally flat throughout its vertical extent for engagement of one side thereof with one of said vertical sides, the intermediate portion forming an included angle of less than 90° with said one side of said first portion and extending a greater distance in a horizontal direction from the upper end of said vertical depending portion than in a vertical direction from the upper end of said vertical depending portion, said second portion extending downwardly from and inwardly toward said one side of said vertical depending first portion and terminating downwardly in an inwardly and upwardly curving coiled portion for frictional engagement with the other of said vertical sides at a point a spaced distance below the level of the lower end of said inclined intermediate portion, displacement of said coiled portion away from said one side of said depending first portion resulting in an increase of the radius of curvature of said arctuate integral connecting portion and an increase in the included angle between said depending first portion and said intermediate portion, whereby more than

minimal spacing changes between said coiled portion and said one side of said vertical depending first portion may be accommodated.

4,418,497

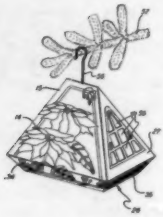
COMBINATION GREETING CARD, ORNAMENT AND SEED GERMINATION BOX

Michael D. Mastriano, 261 Shotwell Park, Syracuse, N.Y. 13206

Filed May 7, 1982, Ser. No. 376,027

Int. Cl.³ A01C *1/04*; B65D *65/28*

U.S. Cl. 47—67 **5 Claims**



1. A combination greeting card, ornament and seed germination box comprising an initially flat blank that is foldable into a three-dimensional hollow ornament, a portion of the blank having a greeting message printed thereon, the blank in its flat form being adapted to be received in a mailing envelope and mailed as a greeting card, and a seed germination packet mounted on the blank, the seed packet being located so that when the blank is folded into a three-dimensional hollow ornament it forms an enclosure for the packet, a portion of the blank having cut-outs forming window openings to permit light to enter the ornament and aid in the seed germination.

4,418,498

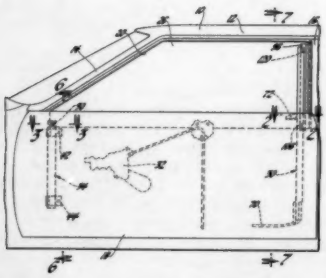
WINDOW GUIDANCE ARRANGEMENT

Bert R. Wanlass, Warren, and James R. Drouillard, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1982, Ser. No. 342,832

Int. Cl.³ E05D *13/02*

U.S. Cl. 49—425 **3 Claims**



1. A window guide mounting a window on a vehicle door for guided movement between a lowered open position and a raised closed position comprising:

a channel track mounted on the door and having first and second opposed facing spaced apart legs having semi-cylindrical opposed facing grooves extending vertically therealong;

a carrier positioned between the channel legs, said carrier having an axial extending bore communicating between the channel legs;

trunnion means mounting the carrier on the window, said trunnion means enabling movement of the carrier relative to the channel track to align the bore with the grooves; and

first and second bearing balls mounted within the bore, said bearing balls being in respective captured rolling contact within the grooves of the first and second channel legs and in rolling contact with one another whereby upon movement of the window between the lowered open and raised closed positions the bearing balls roll against one another and against the first and second channel legs respectively in rolling contact therewith to provide low friction guided movement of the window between the lowered open and raised closed positions and restrain the window against fore and aft movement.

4,418,499

CUTTER GRINDING MACHINE

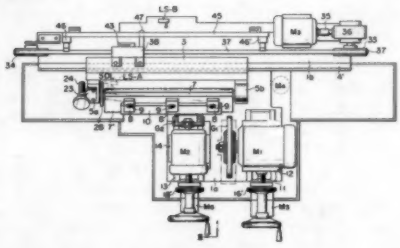
Shigeji Shirai, Shizuoka, Japan, assignor to Shinko Machinery Works Inc., Shizuoka, Japan

Filed Oct. 28, 1980, Ser. No. 201,466

Claims priority, application Japan, Nov. 1, 1979, 54-141714; Dec. 29, 1979, 54-172612; Feb. 5, 1980, 55-12003; Mar. 11, 1980, 55-31741[U]

Int. Cl.³ B24B *3/36*

U.S. Cl. 51—3 **5 Claims**



1. A cutter grinding machine comprising;

a cutter rest to which a cutter to be ground is attached;

a rough grinding wheel coupled to a rough grinding wheel drive motor and movable toward and away from said cutter rest by a rough grinding wheel feed motor;

a finish grinding wheel coupled to a finish grinding wheel drive motor and movable toward and away from said cutter rest by a finish grinding wheel feed motor;

a carriage reciprocated transversely of said grinding wheels by a reciprocating mechanism, said cutter rest being pivotably mounted on said carriage and adjustable about said pivot mounting;

a proximate position detecting means including a switch-actuating lever coupled to said cutter rest, a solenoid for fixing said cutter rest, which is mounted on a support plate fixed to the carriage side, and a limit switch mounted on said support plate at a position functionally corresponding to said switch-actuating lever, said proximate position detecting means being arranged so that when either said rough grinding wheel or said finish grinding wheel is advanced and brought into contact with the ground surface of said cutter said limit switch is actuated to stop the feed motor associated with said one grinding wheel brought into contact with said ground surface and to energize said solenoid for attracting and fixing said cutter rest thereto; and

a carriage reciprocation counting means including a counting limit switch for counting the reciprocating motions of said carriage and a stepping relay which is responsive to said counting limit switch to step up each time the latter is

actuated by the reciprocation of said carriage, said carriage reciprocation counting means being adapted so that said reciprocating mechanism is actuated to reciprocate said carriage until said stepping relay steps up a preset number;

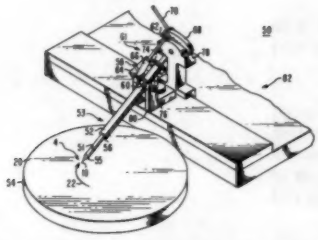
wherein a sequential control system is provided for controlling the machine operation so that first said rough grinding wheel is advanced toward said cutter until said proximate position detecting means is actuated, whereupon the advancement thereof is temporarily stopped and the roughing operation is started and continued until said carriage has reciprocated said preset number of times, whereupon said rough grinding wheel is retreated, and then said finish grinding wheel is advanced toward said cutter until said proximate position detecting means is actuated, whereupon the advancement thereof is temporarily stopped and the finish grinding operation is started and continued until said carriage has reciprocated said preset number of times, whereupon said finish grinding wheel is retreated.

4,418,500

GRINDING APPARATUS

Anil R. Dholakia, East Windsor, and Vincent J. Ruggeri, Howell, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 12, 1981, Ser. No. 292,283
Int. Cl.³ B24B *9/16, 41/06*
U.S. Cl. 51—125.5 **8 Claims**



1. In an apparatus for grinding two flats of substantially the same dimensions in two portions of a conical tip of a stylus element comprising:

(a) means for holding the element,

(b) a rotatably mounted abrasive surface for grinding the tip portion,

(c) means for rotating the element between the two tip portions wherein the point of the tip does not disturb or penetrate the abrasive surface during rotation of the element, and

(d) means for contacting the respective tip portions with the abrasive surface so that a constant force is applied to the tip portion being ground, wherein the tip point does not penetrate or disturb the abrasive surface and wherein the tip remains in contact with the abrasive surface during rotation of the element;

wherein the element holding means is a stylus element holding assembly comprising a holding member to which the stylus element is attached at one end, and a shaft in which the holding member is rotatably mounted;

wherein the element rotating means includes an index wheel drivingly connected to the stylus element holding assembly; and wherein the stylus element holding assembly includes a flipping lever and the index wheel is drivingly connected to the flipping lever;

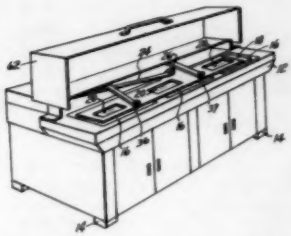
wherein the improvement comprises a fork assembly having flexible fork members attached to the index wheel wherein the fork assembly is drivingly connected to the flipping lever, whereby substantially the same tip portions are in contact with the abrasive surface after each alternate rotation.

4,418,501

LAPPING MACHINE AND METHOD

Raymond P. DeSantis, Troy, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.

Filed May 15, 1981, Ser. No. 264,037
Int. Cl.³ B24B *25/00*
U.S. Cl. 51—157 **4 Claims**



1. A lapping machine comprising at least one lap plate, a workpiece holding plate disposed proximate said lap plate and adapted to hold a workpiece with a surface thereof in engagement with said lap plate, power means for reciprocating said holding plate along a first axis of direction, power means for displacing said holding plate along a second axis of direction, said second axis being at an angle to said first axis, such that to each complete reciprocation cycle along said first axis corresponds a small displacement along said second axis, and means for adjusting the length of displacement of said holding plate along said first axis and said second axis for causing a point of the surface in engagement with said lap plate to travel substantially over the whole area of said lap plate in the course of a lapping operation cycle, wherein said means for displacing said holding plate along said first axis comprises a first link pivotally attached at one end to said holding plate and pivotally attached at another end to a first eccentric, and a first power driven rotatable shaft for rotating said first eccentric, and wherein said means for displacing said holding plate along said second axis comprises a second rigid link and a third rigid link disposed substantially parallel, each of said second and third links being pivotally attached at one end to said holding plate and pivotally attached at another end respectively to a second and third eccentrics, and a second and third power driven rotatable shafts each rotating respectively said second eccentric and said third eccentric.

4,418,502

ELEVATABLE GRINDING WHEEL MOTOR SUPPORT

Lynn J. Ziegelmeyer, P.O. Box 1112, Medford, Oreg. 97501

Filed Jul. 6, 1981, Ser. No. 281,211
Int. Cl.³ B24B *41/04*
U.S. Cl. 51—166 MH **2 Claims**

1. In grinding apparatus including a grinding station and a grinding wheel motor disposed to one side of said station, means supporting said motor for adjustable movement with respect to the station comprising

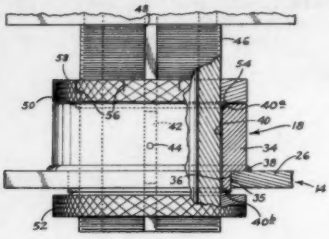
a threaded element fixed to the motor,

a frame,

a mounting for the threaded element carried by said frame at a fixed position with respect to said station, said mounting having an internal bore extending therethrough which receives said element with clearance provided between outer extremities of the threads in the element and the inner surface of the bore,

a pair of nuts screwed onto said element bearing on opposite sides of said mounting, and

means interposed between said mounting and said element preventing relative rotational movement therebetween, said nuts and opposite sides of said mounting having means producing centering of said threaded element in said bore with tightening of said nuts against opposite sides of said



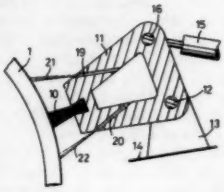
mounting, said means producing centering comprising annular beveled recesses on opposite sides of the mounting encircling the bore and annular shoulders on said nuts contactable with said recesses to produce centering of said threaded element in said bore.

4,418,503

APPARATUS FOR CONTINUOUSLY POLISHING THE PRESSURE ROLLER OF A COILING MACHINE

Pierre G. Dantinne, 6, rue du Coudrier, 4100 Seraing, Belgium

Filed Dec. 12, 1980, Ser. No. 215,682
Claims priority, application Belgium, Dec. 27, 1979, 198772
Int. Cl.³ B24B *19/00*
U.S. Cl. 51—252 **1 Claim**



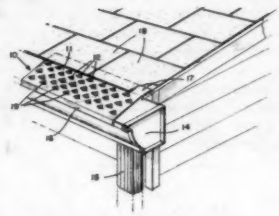
1. An apparatus for the continuous polishing of a pressure roller in a coiling machine, comprising at least one abrasive rubbing element which extends parallel to the axis of rotation of and over the entire length of the face of the roller, said abrasive rubbing element being mounted on a longitudinal roller, said longitudinal support being mounted to pivot about two coaxial pivots under the action of at least one pneumatic control jack to which it is pivotably connected, said jack being itself articulated on another pivot which is parallel to said two coaxial pivots, thereby to elastically apply the abrasive rubbing element against the face of said roller as the latter rotates in the coiling machine, so as to smooth said roller face and remove any asperities adhering thereto during the winding of a coil, and said longitudinal support being hollow and supplied with cooling water, said support having a plurality of orifices for projecting jets of water onto the face of the roller near the rubbing element and at least upstream of said rubbing element relative to the direction of rotation of the roller, wherein the pivots for the longitudinal support of the abrasive rubbing element and the pivot of the control jack are mounted on the cradle of the roller, wherein the abrasive rubbing element is formed of a straight row of successive abrasive element segments is constituted by a plurality of abrasive sheets which are superposed and clamped against one another in their housing on their support whose faces abut on one another and whose end faces of the row are oblique in relation to the longitudinal direction of said row.

4,418,504

DRAIN SHIELD FOR GUTTERS

Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260

Filed Oct. 19, 1981, Ser. No. 312,498
Int. Cl.³ E04D *13/00*
U.S. Cl. 52—12 **6 Claims**



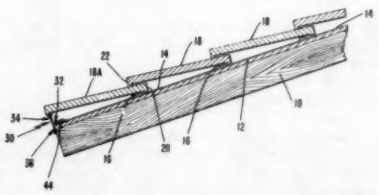
1. A drain shield for a gutter comprising: a planar base member having upper and lower surfaces and adapted to be installed on a roof in a downwardly sloping manner over a gutter, a series of arch means, said arch means raised from said upper surface of said base member, trough means, said trough means extending below said lower surface of said base member and down the slope from said arch means, said arch means having an opening in a down slope position in front of and centered with said trough means.

4,418,505

STARTER STRIP FOR A TILE ROOF

Roger D. Thompson, La Canada, Calif., assignor to Boral (USA) Inc., Los Angeles, Calif.

Filed Jan. 13, 1982, Ser. No. 339,085
Int. Cl.³ E04B *7/00*
U.S. Cl. 52—95 **13 Claims**



10. A starter strip for a tile roof for supporting the nose ends of eave course tiles, said starter strip comprising a base portion having an upper surface and a lower surface adapted to rest atop a roof sheathing, a cover portion extending transversely from a forward edge of said base portion, said cover portion including an exposed front face, and a riser portion extending trasversely from said forward edge in a generally upward direction generally opposite said cover portion, an upper edge of said riser portion reversing back to define a reinforced edge capable of supporting a tile, and a plurality of water drainage apertures extending completely through said riser portion immediately above the junction of the latter with said base portion to communicate said upper surface of said base portion with said exposed front face of said riser portion, said strip comprising a solid piece of metal bent at the junction between said riser portion and said base portion to form a first section of said base portion extending away from said riser portion and bent 180 degrees to form a second section extending back toward said cover portion, said second section being bent at

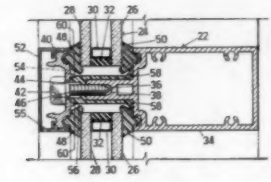
the junction between said cover portion and said base portion, said first and second sections disposed in planar contact with each other, said upper edge of said riser portion being bent back to define said reinforcing edge.

4,418,506

GLAZED WALL CONSTRUCTION SYSTEM

Ronald J. Weber, and Lyon E. Evans, both of Wausau, Wis., assignors to Wausau Metals Corporation, Wausau, Wis.

Filed Sep. 2, 1980, Ser. No. 182,866
Int. Cl.³ E04B *2/88*; E06B *7/14*
U.S. Cl. 52—209 **9 Claims**



1. In a wall construction system including a plurality of wall panels (24) supported in place by a frame system (22), the frame system (22) comprising:

a frame member (34) for providing structural support for the frame system, the frame member (34) being located behind the wall panels (24);

a boss (36) formed on the frame member (34) extending forwardly between a pair of adjacent wall panels (24), the boss (36) having a receptacle (38) formed in it;

an exterior plate (40) attached to the boss (36) on the frame member (34) to hold the wall panels (24) between the plate (40) and the frame member (34), the exterior plate (40) having at least one centrally located fastener hole (44) formed in it;

a separator (56) interposed between the boss (36) on the frame member (34) and the exterior plate (40), the separator (56) formed of low-heat conductive material to thermally separate the exterior plate (40) and the frame member (34); and

a threaded fastener (42) formed of a metallic sheet metal threaded fastener (62) having an enlarged head (64) molded on it from low-heat conductive material, the molded head (64) including a pilot shaft (66) extending downwardly therefrom, the fastener (62) extending through the respective holes in the exterior plate (40) and the separator (56) to fasten the exterior plate (40) to the frame member (34) while the molded head (64) of the fastener (42) thermally isolates the frame member (34) from both the exterior air and the exterior plate (40).

4,418,507

INTERIOR WALL SYSTEM

Frank W. Roberts, 380 E. 7500 South, Midvale, Utah 84047; Richard A. Roberts, 4973 Regency; W. Calvin Roberts, 4906 Regency, both of Holladay, Utah 84117; Jack A. Nipko, 13735 Shadow Mountain La., Draper, Utah 84020; Clark S. Roberts, 4906 Regency, Holladay, Utah 84117, and Hal R. Hudson, 759 S. 300 West, Orem, Utah 84057

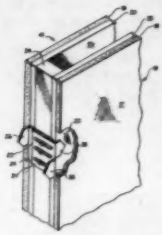
Filed Jun. 30, 1981, Ser. No. 278,951
Int. Cl.³ E04B *2/30*
U.S. Cl. 52—241 **14 Claims**

1. An interior wall system comprising:

top and bottom support members;

first and second walls attached to said support members, each wall comprising a plurality of composite wall panels, and each composite wall panel comprising an exterior surface material and an interior insulating material bonded to one side of said exterior surface material; and

a plurality of retaining clips interconnecting said first and second walls and also interconnecting the composite wall panels of each wall in abutting relationship, each said clip



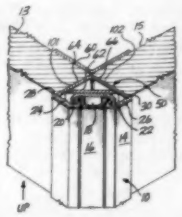
comprising two members which are selectively positionable with respect to each other, at least a portion of said members extending between said first and second walls, so as to provide means for adjusting the width between said first and second walls.

4,418,508

RUB STRIP ASSEMBLY HAVING LENGTHWISE GROOVE FOR RECEIVING SNAP-IN MEMBER

Keith E. Gilliland, Everett, and Richard W. Morris, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 20, 1981, Ser. No. 255,911
Int. Cl.³ E04F *19/02*
U.S. Cl. 52—282 **1 Claim**



1. A corner assembly for fastening together the end surfaces (101 and 102) of first and second panel members in 90 degree relationship with respect to the major surface areas of said panel members comprising in combination:

a right angle corner bumper bracket disposed for fastening between said end surfaces (101 and 102) of said first and second panel members, said right angle corner bumper bracket including a transversely disposed strip extending along said bumper bracket in the region forming the right angle thereof;

an elongated member having first and second leg portions and a lengthwise groove extending along the length of said elongated member between said first and second outer leg portions, said lengthwise groove including a plurality of fasteners distributed along the length thereof for fastening said elongated member to said transversely disposed strip, said first and second outer leg portions abutting said major surface areas of said first and second panel members;

a channel member having sides, said sides having end portions, and said channel member having a generally U-shaped cross section disposed within said lengthwise groove with said end portions of the sides of said channel

member abutting the bottom surface of said lengthwise groove.

4,418,509

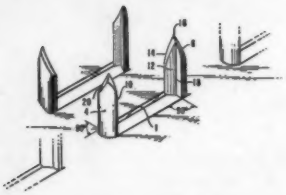
STRUCTURAL JOINT CONNECTOR

Anthony M. Moyer, Hollywood, and Robert H. Kelly, Miramar, both of Fla., assignors to Gang-Nail Systems, Inc., Miami, Fla.

Division of Ser. No. 71,551, Aug. 30, 1979, Pat. No. 4,343,580. This application Dec. 3, 1981, Ser. No. 327,198

Int. Cl.³ E04C *3/02;* **B25G** *3/28;* **F16D** *1/02*

U.S. Cl. 52—693 **10 Claims**



1. A structural joint for bearing a structural load comprising: a pair of wooden members fastened together by at least one metal connector plate, said connector plate having: a plurality of pairs of elongated teeth struck from said plate so as to project in a direction substantially perpendicular to said plate; said teeth being struck in pairs so as to leave a plurality of longitudinally extending slots with each of said pairs of teeth being associated with one of said slots; each of said teeth having a pointed tip; each of said teeth having a knife edge portion extending from said plate, said knife edge portion of each said tooth having a cross-sectional thickness thinner than the remaining portion of said tooth and having a sharp edge with a cross-sectional angle of less than 20° and said sharp edge of each said knife portion extending from said pointed tip of each of the respective said teeth along a continuous substantially arcuate path to said plate for facilitating penetration of each of said teeth into the respective wooden member to which said connector plate is attached; said knife edge portion of said teeth of said pairs of teeth lying along opposite longitudinal sides of the corresponding said slot; a first group of said teeth of said pairs of teeth being oriented so that their said knife edge portions extend along the corresponding said slots in one direction; and a second group of said teeth of said pairs of teeth being oriented so that their knife edge portions extend along the corresponding said slots in the opposite direction.

4,418,510

STRETCH WRAPPING APPARATUS AND PROCESS

Patrick R. Lancaster, III, Anchorage, and William G. Lancaster, Louisville, both of Ky., assignors to Lantech, Inc., Louisville, Ky.

Continuation of Ser. No. 74,786, Sep. 12, 1979. This application Apr. 17, 1981, Ser. No. 255,222

Int. Cl.³ B65B *11/04*

U.S. Cl. 53—399 **4 Claims**

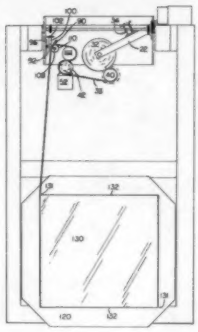
1. A process of making a unitary package by wrapping a plurality of units with a stretched plastic material overwrap forming a unitary load comprising the steps of:

a. placing a load on a support;

b. positioning a roll of stretchable plastic material on a dispenser means adjacent to said support;

c. withdrawing a leading end of said plastic material from said dispenser means and passing said plastic material through a powered prestretch device adapted to drive the plastic material at a proportional speed with respect to the surface speed of the load, said prestretch device comprising a powered roller assembly with at least one rotationally restrictive roller assembly, said rotationally restrictive roller assembly being retarded to a substantially constant relative speed with respect to the rotationally powered roller assembly so that the plastic material is elongated substantially above its yield point between the roller assemblies, thereby changing strength characteristics and cross-sectional area of the plastic material;

d. holding said plastic material adjacent said load and simultaneously prestretching said plastic material substantially above the yield point by driving said prestretch device and causing relative rotation between said load and said dispenser means at a predetermined speed;



e. substantially reducing the force on the plastic material while maintaining the majority of the elongation incurred in said powered prestretch device through inelastic strain recovery after it leaves the powered prestretch device; and

f. covering the load with previously elongated plastic material so that the units of the load are held under a compressive force.

4,418,511

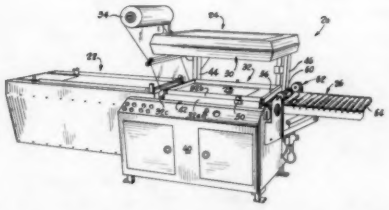
APPARATUS AND METHOD FOR FILM PACKAGING

Everett E. Collin, Gray Court, S.C., assignor to Nordson Corporation, Amherst, Ohio

Filed Jun. 13, 1980, Ser. No. 159,365

Int. Cl.³ B65B *11/52, 61/28*

U.S. Cl. 53—427 **17 Claims**



1. In apparatus for film packaging comprising a vacuum platen, a film supportig frame, the platen and frame being relatively movable toward and away from each other, means for heating film supported by the frame, and means for drawing a vacuum through the platen, the improvement comprising a plate on the platen constructed to support a major portion of a package on the platen and slidable in a forward and back direction on the platen, the plate having a length in the direction of sliding motion greater than half the length of the platen and less than the full length and having an abutment for engaging a package and moving the package relative to the platen, said plate being constructed and arranged to permit flow of gas

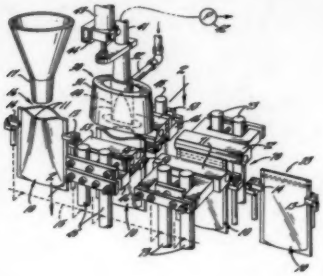
through the plate to the underlying platen, and means to slide the plate relative to the platen.

4,418,512

MACHINE AND METHOD FOR MAKING SUBSTANTIALLY AIR-FREE SEALED POUCHES

Kenneth R. Johnson, Sarasota, Fla., assignor to Rexham Corporation, New York, N.Y.

Filed Mar. 25, 1981, Ser. No. 247,253
Int. Cl.³ B65B *31/00*
U.S. Cl. 53—434 **4 Claims**



1. A packaging machine for filling, evacuating and closing flexible pouches having open upper end portions, said machine comprising means for advancing the pouches open end up along a predetermined path, means for introducing product into each pouch, a nozzle, means for inserting said nozzle downwardly into each filled pouch, closing means operable to close the upper end portion of the pouch around said nozzle, means for drawing a vacuum through said nozzle to evacuate the air in the pouch, means for retracting said nozzle out of the pouch, said closing means holding the upper end portion of the pouch closed around said nozzle as the nozzle is retracted, means for continuously directing steam downwardly toward the upper end portion of the pouch at least from the time said nozzle is inserted into said pouch to a time subsequent to retraction of the nozzle out of the pouch, and means for closing the upper end portion of the pouch after retraction of the nozzle.

3. A method of filling, evacuating and closing flexible pouches having open upper end portions, said method comprising the steps of advancing the pouches open end up along a predetermined path, introducing product into each pouch while holding the upper end portion of the pouch in an open position, inserting a nozzle downwardly into each filled pouch, closing the upper end portion of the pouch around the nozzle, drawing a vacuum through the nozzle to evacuate the air in the pouch, retracting the nozzle upwardly from the pouch while holding the upper end portion of the pouch around the nozzle, closing the upper end portion of the pouch immediately after retraction of the nozzle, and directing steam downwardly toward the upper end of the pouch continuously from a time prior to insertion of said nozzle to a time subsequent to closing of the pouch.

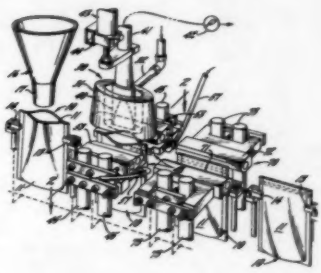
4,418,513

PACKAGING MACHINE WITH MEANS FOR CLOSING FLEXIBLE POUCHES AROUND A NOZZLE

Jack E. Plahm, Bradenton, Fla., assignor to Rexham Corporation, New York, N.Y.

Filed Apr. 16, 1981, Ser. No. 254,916
Int. Cl.³ B65B *31/00*
U.S. Cl. 53—434 **8 Claims**

1. A packaging machine for filling, purging and sealing flexible pouches having open upper end portions, said machine comprising means for advancing the pouches open end up along a predetermined path, means for introducing product into each pouch, a nozzle, means for inserting said nozzle downwardly into each filled pouch, closing means operable to close the upper end portion of the pouch around said nozzle, means for creating a flow of gas through said nozzle to purge the pouch, means for retracting said nozzle out of the pouch, said closing means holding the upper end portion of the pouch closed around said nozzle as the nozzle is retracted, and means for sealing the upper end portion of the pouch after retraction of the nozzle, said machine being characterized in that said closing means comprise a pair of heads disposed on opposite sides of the upper end portion of the pouch, and means for directing pressurized gas through said heads and against the pouch whereby said pressurized gas closes the pouch around said nozzle and holds the pouch closed during retraction of the nozzle.



8. A method of filling, purging and closing flexible pouches having open upper end portions, said method comprising the steps of advancing the pouches open end up along a predetermined path, introducing product into each pouch while holding the upper end portion of the pouch in an open position, inserting a nozzle downwardly into each filled pouch, directing pressurized gas towards opposed sides of the pouch to close the upper end portion of the pouch around the nozzle, creating a flow of gas through the nozzle to purge the pouch, retracting the nozzle upwardly from the pouch while directing pressurized gas toward the sides of the pouch to hold the upper end portion of the pouch around the nozzle during retraction of the nozzle and closing the upper end portion of the pouch immediately after retraction of the nozzle.

4,418,514

ORTHOPEDIC SUPPORT PACKAGE AND METHOD

Donald C. Spann, 1003 Botany Rd., Greenville, S.C. 29615

Continuation of Ser. No. 194,359, Oct. 6, 1980, abandoned. This application Oct. 23, 1981, Ser. No. 314,181
Int. Cl.³ B65B *61/24*
U.S. Cl. 53—436 **9 Claims**

4. The method of packaging and dispensing an orthopedic support comprising:

providing an orthopedic support constructed essentially of resilient synthetic open cell foam material with air entrained therein having a substantial and irregular height profile and a highly bulky configuration;

providing a thermoplastic bag constructed of heat sealable thermoplastic multi-layered film having a sufficient shelf life to prevent leaking and seeping of air affording storage of said package in a healthcare facility for extended periods of time, said bag being presealed along its edges but providing an open edge portion thereof for insertion of said orthopedic support therethrough;

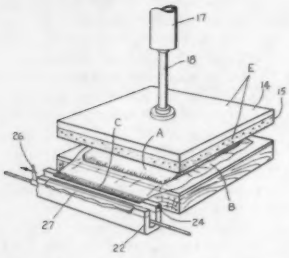
placing said orthopedic support within said bag;

differentially compressing said orthopedic support within said bag to such an extent as to reduce said substantial profile and bulk configuration by a major amount to a generally uniform flat configuration with evacuation of a

corresponding amount of air from said bag by utilizing fluid pressure to urge a platen of a press into compressing relation with a bed of the press by a predetermined amount;

placing a heat seal along said single open edge portion after said compression and evacuation;

releasing the compressing action of said press after heat sealing said edge portion resulting in the formation of an evacuated marginal portion of said bag extending outwardly about said orthopedic support by an amount corresponding to the reduction in height of said orthopedic support forming a package;



storing said package by a healthcare facility in said compressed generally uniform flat configuration until such time as utilized by an orthopedic patient at said facility; and

dispensing said product at said time of utilization by releasing compression in said bag and said orthopedic support compressed therein permitting return of said orthopedic support substantially to its original full unrestrained profile and configuration when needed for use by an orthopedic patient.

4,418,515

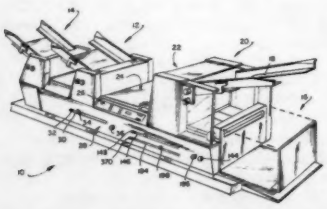
INSERTER GAUGING SYSTEM

Dean H. Foster, Stratford; Robert E. Mersereau, Westport, and Harold Silverman, Norwalk, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 26, 1980, Ser. No. 210,474

Int. Cl.[3] **B65B** *43/26, 43/44, 39/12, 5/04*

U.S. Cl. 53—457 **9 Claims**



2. In an envelope inserter having a longitudinally-extending axis and comprising means for feeding envelopes to an envelope station, envelope positioning means at the envelope station, an array of stripper fingers, means for mounting each stripper finger for reciprocal movement in a vertically extending plane into an envelope to open the mouth of the envelope at the envelope station and ram means for inserting an enclosure into the opened envelope, the improvement comprising means for laterally varying the plane of at least one stripper finger and thus the plane of reciprocal movement of said at least one stripper finger whereby the one stripper finger is adjustably positionable to accommodate envelopes of differing lengths.

4,418,516

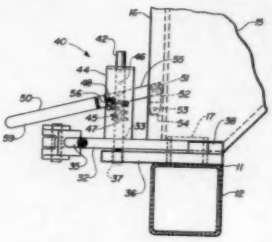
TRANSPORT LOCK ACTUATOR

James T. Donovan, Gordonville, and E. Graham Webster, New Holland, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 2, 1982, Ser. No. 364,951

Int. Cl.[3] **A01B** *73/00*

U.S. Cl. 56—228 **10 Claims**



1. In a crop harvesting machine having a mobile frame, said frame having a first aperture therethrough; harvesting apparatus supported by said frame for the harvesting of crop material; a tongue having a first end and a remote second end, said first end being pivotally mounted on said frame such that said tongue is pivotally moveable relative to said frame, said first end having a base member affixed thereto and pivotally moveable with said tongue relative to said frame, said base member having a second aperture therethrough alignable with said first aperture in said frame, said second end being adapted for connection to a primary mover; power means for pivotally moving said tongue relative to said frame; a locking pin insertable through said first and second apertures when said first and second apertures are aligned to lock said tongue in a preselected position relative to said frame, said locking pin being in a locked position when interengaged between said base member and said frame through said first and second apertures and in an operating position when disengaged from between said frame and said base member such that said tongue is free to pivotally move relative to said frame, the improvement comprising:

a spring-loaded actuator operatively and selectively engaged with said locking pin to selectively bias said locking pin toward said locked position to automatically move said locking pin into said locked position when said first and second apertures become aligned due to the movement of said tongue by said power means, said actuator also being selectively operable to bias said locking pin toward said operating position to automatically move said locking pin into said operating position when said first and second apertures become aligned.

4,418,517

ACTUATING MECHANISM FOR HARVESTER TRANSPORT LOCK

Philip J. Ehrhart, Narvon; James T. Donovan, Gordonville, and E. Graham Webster, New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 19, 1982, Ser. No. 369,947

Int. Cl.[3] **A01B** *73/00*

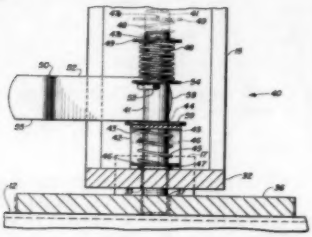
U.S. Cl. 56—228 **11 Claims**

1. A transport lock actuating mechanism for a crop harvesting machine having a mobile frame, said frame having a first aperture therethrough, harvesting apparatus operatively supported on said frame for the harvesting of crop material, a tongue having a first end pivotally connected to said frame and

a remote second end adapted for connection to a primary mover, a base member affixed to the first end of said tongue to be pivotally movable therewith and having a second aperture therethrough alignable with said first aperture, and power means interconnecting said tongue and said frame for pivoting said tongue relative to said frame, in combination comprising:

(a) a housing mounted on said base member and movable therewith;

(b) a locking pin slidably received within said housing for insertion through said second aperture, said locking pin including first and second spaced-apart spring retention members, said locking pin being movable between a locked position in which said locking pin extends through both said first and second apertures such that said base member is not free to move relative to said frame and an



unlocked position in which said locking pin does not extend through both said first and second apertures and said base member is free to move with said tongue relative to said frame;

(c) a first spring concentrically mounted on said locking pin adjacent said first spring retention member;

(d) a second spring concentrically mounted on said locking pin adjacent said second spring retention member;

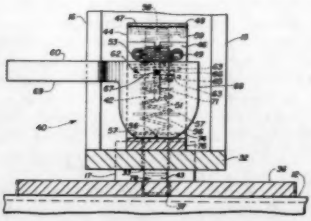
(e) first and second separably movable compression means for compressing said first spring against said first retention member and for compressing said second spring against said second retention member, respectively, such that said locking pin is biased toward said locked position when said first spring is compressed and biased toward said unlocked position when said second spring is compressed.

4,418,518

MECHANISM FOR SPRING LOADING A TRANSPORT LOCK

Earl E. Koch, Mohnton; A. Dale Gamber, Lancaster, and Philip J. Ehrhart, Narvon, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed May 3, 1982, Ser. No. 374,356
Int. Cl.³ A01B *73/00*
U.S. Cl. 56—228 **9 Claims**



1. A transport lock actuating mechanism for a crop harvesting machine having a mobile frame, said frame having a first aperture therethrough, harvesting apparatus operatively supported on said frame for the harvesting of crop material, a tongue having a first end pivotally connected to said frame and a remote second end adapted for connection to a primary mover, a base member affixed to the first end of said tongue to be pivotally movable therewith and having a second aperture therethrough alignable with said first aperture, and power means interconnecting said tongue and said frame for pivoting said tongue relative to said frame, comprising:

(a) a housing mounted on said base member and movable therewith, said housing including two spaced-apart leg members affixed to said base member on opposing sides of said second aperture and a bight portion spaced from said base member and connected to said leg members;

(b) a locking pin positioned between said leg members for insertion through said second aperture and said first aperture when aligned with said second aperture, said locking pin being in a locked position when inserted through both said first and second apertures, thereby preventing relative movement between said base member and said frame, and in an unlocked position when said locking pin does not extend into said first aperture such that said base member is free to move relative to said frame;

(c) first and second springs concentrically mounted on said locking pin, said first and second springs being compressible to bias said locking pin toward said unlocked and said locked positions, respectively;

(d) first and second spring retention members fixed to said locking pin to limit the movement of said first and second springs relative to said locking pin;

(e) a spring engaging member concentrically mounted on said locking pin between said first and second springs for sliding movement relative to said locking pin to selectively engage said first spring and said second spring for compression thereof against said first retention member and said second retention member, respectively; and

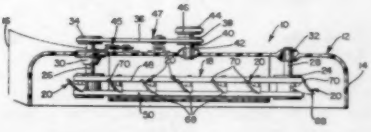
(f) an actuating lever pivotally connected to said spring engaging member and operble to selectively move said spring engaging member toward said first retention member and said second retention member to compress said first and second springs, respectively, said actuating lever being further operable to retain said first and second springs in said compressed state until said locking pin moves into the respective position in which it has been biased.

4,418,519

ENDLESS CHAIN TYPE LAWN MOWER

Mark R. Fralish, Berlin, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 29, 1982, Ser. No. 403,248
Int. Cl.³ A01D *55/24*
U.S. Cl. 56—244 **3 Claims**



1. A lawn mower comprising a generally horizontally extending elongated open bottom housing having a grass discharge opening on one side thereof, said housing having a generally vertical side wall, an endless chain-like plastic cutter assembly supported for powered rotational movement within said housing, said cutter assembly including a plurality of plastic impact members, each impact member including an elongated generally flat portion extending horizontally and merging with a curved wing portion having a leading impact edge and a trailing lift edge, said cutter assembly further including a pair of spaced apart generally parallel plastic endless bands and means for connecting said impact members between

said bands, said connecting means permitting said impact members limited pivotal movement upon striking obstacles during rotation of said cutter assembly, and said cutter assembly being rotated with the lift portions of said impact members acting to create an aerating effect and vacuum or suction within said housing for causing grass to be raised for cutting and for discharging cut grass outwardly through said opening in said housing.

4,418,520

THRUST SWIVEL BEARING ON MOWING KNIVES SUPPORTED IN SWINGING LEVERS OF MOWER CUTTING SYSTEMS

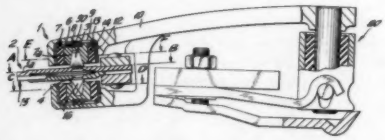
Rudolf Schneider, Remscheid, and Bruno Hüsch, Bad Neuenahr-Ahrweiler, both of Fed. Rep. of Germany, assignors to Busatis-Werke GmbH u.Co K.G. Boge GmbH, Eitorf, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,365

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922579

Int. Cl.³ A01D *55/02*

U.S. Cl. 56—297 **19 Claims**



1. A thrust swivel bearing for resiliently supporting a mowing knife in a swing arm of a mower cutting system, comprising a rubber-metal block including an external metal bushing adapted for non-rotatable connection with the swing arm, an annular rubber portion disposed concentrically within said external bushing, and an internal metal bushing disposed concentrically within said rubber portion, and engagement means for non-rotatably securing said rubber-metal block to the mowing knife, said engagement means including a coupling pin surrounded by said internal bushing, said coupling pin adapted for connection to the mowing knife, said rubber-metal block capable of being disconnected in axial direction of said bushings from either one of the swing arm and the mowing knife.

4,418,521

HARVESTER WITH SELECTIVE FORCE BALANCED SHAKING MECHANISM

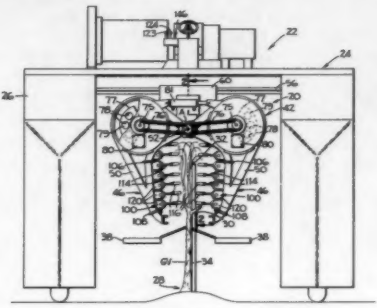
Franklin P. Orlando, Morgan Hill, and Donald G. Mortensen, San Jose, both of Calif., assignors to FMC Corporation, Chicago, IL

Filed Dec. 11, 1981, Ser. No. 329,786

Int. Cl.³ A01D *46/00*

U.S. Cl. 56—330 **10 Claims**

1. A harvester for shaking crops such as grapes from plants grown in a row comprising a vehicle movable along said row, means defining a front force balanced shaking unit with a shaking head on each side of the row, means defined a rear force balanced shaking unit with a shaking head on each side of the row, means for pivotally supporting said front and rear heads on said vehicle for pivotal movement only about a common axis extending longitudinally of the row during harvesting, and selectively operable power means on the vehicle connected to said front unit and said rear unit for oscillating said heads transversely of the row only about said common axis; the improvement which comprises a foliage shaker assembly rigidly secured to each of said heads each foliage shaker assembly including a plurality of substantially horizontal flexible resilient tines each having a mounting end fixed to the associated head and a free end projecting rearwardly and inwardly toward the adjacent sides of said plants and movable relative to said associated heads only in response to resilient deflection of said tines, said tines being responsive to forward movement of the vehicle and to oscillation of the heads only



about said common axis by said power means for striking the vines thereby removing the crop therefrom.

4,418,522

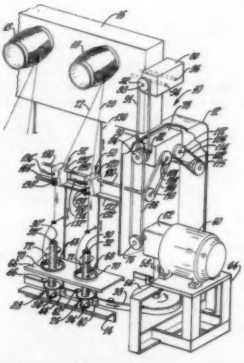
KNOCKOFF CONTROL SYSTEM AND APPARATUS FOR TEXTILE STRAND TWIST FRAMES

Kenneth T. Harrop, and Robert D. McArtor, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 29, 1981, Ser. No. 278,306

Int. Cl.³ D01H *7/22, 13/16*

U.S. Cl. 57—80 **2 Claims**



1. Apparatus for transferring dual strands of filamentary material from a single supply package onto first and second bobbins mounted on first and second spindles comprising:

a. a first knockoff device controlling a drive to the first spindle and a drive to the supply package, said first knockoff device having means normally under the influence of tension in the first strand of filamentary material for establishing the drive to the first spindle and the drive to the supply package such that the breakage of the first strand being effective on the first knockoff device to interrupt the drive to the first spindle and the drive to the supply package,

b. a second knockoff device having means normally under the influence of tension in the second strand of filamentary material for establishing a drive to the second spindle whereby the interruption of the drive to the supply package interrupts feeding of the strands such that the second strand is broken by tension interrupting the drive to the second spindle, and

c. means for establishing interconnection between the second knockoff device with the first knockoff device such that the breakage of the second strand, before breakage of the first strand, interrupts the drive to the second spindle and activates the first knockoff device to interrupt the drive to the first spindle and the supply package.

4,418,523

NOTCHED ROLLER FOR PRODUCING FANCY YARNS IN SPINNING-TWISTING MACHINES

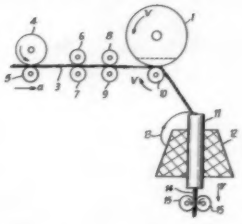
Paul Lemaire, Wambrechies, France, assignor to Filature Saint Andre, Saint Andre, France

Filed Aug. 7, 1981, Ser. No. 291,128

Claims priority, application France, Jul. 2, 1981, 81 13017

Int. Cl.³ D02G 3/36, 3/34

U.S. Cl. 57—207 **4 Claims**



1. A spinning-twisting machine for producing fancy yarns from a non-twisted sliver of textile fibers, said machine having an inlet end at which the sliver of textile fibers is introduced into the machine and an outlet end from which the fancy yarn is removed from the machine, said machine comprising a pair of feed cylinders located at the inlet end for feeding the sliver through the machine, a pair of drawing cylinders spaced from said pair of feed cylinders, said pair of drawing cylinders comprising a first cylinder having a continuous smooth cylindrical circumferentially extending surface for its full axial length and a second cylinder comprising two sections in axial alignment one following the other with at least one of said sections having at least one circumferentially extending notch formed in the circumferential peripheral surface thereof, said notch extending in the circumferential and axial direction of said second cylinder, said drawing cylinders arranged to be driven at a peripheral speed greater than the peripheral speed of said feed cylinders, said drawing cylinders arranged for forming a nip therebetween with the sliver passing through the nip of said drawing cylinders for the full axial length of the nip which includes the full axial length of said two sections of said second cylinder, a rotatable tubular spindle located between said nip of said drawing cylinders and said outlet end and arranged so that the sliver exiting from the nip of said drawing rollers passes through said tubular spindle, a package of a covering textile thread mounted on said tubular spindle for rotation therewith and said covering thread entering said tubular spindle with the sliver, a pair of take-up cylinders located at said outlet end of said machine for pulling the fancy yarn through said spindle, said take-up cylinders having a peripheral speed greater than the peripheral speed of said feed cylinders, so that the portion of the sliver passing through the notch in said second drawing cylinder is subjected to a false twist by the rotating action of said tubular spindle and is stretched by the action of said take-up cylinders while the remaining portion of the sliver passing through the nip of said drawing cylinders outside of said notch is pulled at a speed greater than the linear speed of the portion of the sliver passing through said notch and is wound around the portion of the sliver passing through said notch whereby all of the fibers of the sliver enter said rotary tubular spindle together along with the covering thread to form the fancy yarn withdrawn from the tubular spindle by said take-up cylinders.

4,418,524

TWISTED YARN AND TWISTED BUNDLE OF YARNS

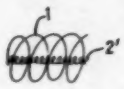
Osamu Ito, Utsunomiya, and Kazunori Nishizawa, Funabashi, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,124

Claims priority, application Japan, Jun. 19, 1980, 55-83390; Apr. 27, 1981, 56-63602

Int. Cl.³ D02G 3/38, 3/04

U.S. Cl. 57—239 **23 Claims**



1. A twisted combination yarn comprising two twisted, plied, first and second yarns, said first yarn being capable of being shrunk in the direction of the yarn length at least 10% of the original yarn length and being capable of being rendered elastic on contact with water, said first yarn consisting essentially of fibers selected from the group consisting of carboxymethylated cellulose fibers, methylated cotton fibers, sulfated cotton fibers, cationized cotton fibers and partially saponified acrylic fibers, and said second yarn consists essentially of fibers which do not shrink more than 10% in length on contact with water.

4,418,525

DOUBLE-SIDED OPEN END SPINNING MACHINE

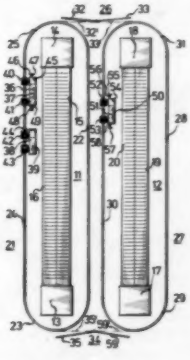
Hans Raasch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,573

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111627

Int. Cl.³ D01H 13/22, 13/14, 13/26

U.S. Cl. 57—264 **10 Claims**



1. Double-sided open end spinning machine, comprising at least one closed travel track, a servicing device for traveling along the machine and a thread testing device for traveling along the machine, at least said servicing device being disposed on said at least one closed travel track, said servicing device including a travel direction reversing device and a travel obstacle indicator for each travel direction, said travel obstacle indicator being connected to said travel direction reversing device for reversing travel direction of said servicing device.

4,418,526
CHAIN COUPLING OR LOCKING LINK

Anton Clement, Iserlohn-Letmathe, Fed. Rep. of Germany, assignor to August Thiele, Iserlohn-Kalthof, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,459

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 8104620[U]

Int. Cl.³ F16G *15/04*

U.S. Cl. 59—85 **3 Claims**

1. A chain coupling or locking link, particularly for use in heavy-duty round steel chains, comprising a pair of complementary J-shaped link halves each defining two arms of different lengths, interlockable tongue-and-groove joints formed at facing end portions of said halves, and an arresting recess formed transversely to the major center plane of symmetry of the link in the inner wall portion of the longer arms; an arresting piece insertable between said wall portions and having projecting noses engageable with the respective arresting recesses to prevent said halves from shifting; an inclined bore passing through the opposite halves and said arresting piece for receiving a safety pin; said noses and the corresponding arresting recesses having different cross sections when viewed in the major plane of symmetry of the link to permit the insertion of said arresting piece between said halves in a predetermined orientation only.

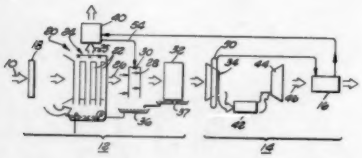
4,418,527
PRECOOLER FOR GAS TURBINES

Leslie A. Schlom, 5524 Saloma Ave.; Michael B. Dubey, 5518 Saloma Ave., both of Van Nuys, Calif. 91411, and Andrew J. Becwar, 818 Old Landmark La., La Canada, Calif. 91011

Filed Apr. 21, 1980, Ser. No. 141,759

Int. Cl.³ F02C *7/00*

U.S. Cl. 60—39.05 **2 Claims**



1. Humidifier and scrubber means for cooling and washing intake air to improve the performance of a gas turbine system, said system including a combustion chamber, a turbine exhausting hot gas and an air compressor for compressing ambient air to supply the combustion chamber with compressed air, said means comprising:

an indirect evaporative heat exchanger having a dry side, a wet side and an exhaust from said wet side;

a water spray;

means for conveying ambient air through the dry side of the indirect evaporative heat exchanger to sensibly cool said air;

means for conveying said sensibly cooled air through said water spray to clean, humidify and further cool said air;

means for collecting water that has not evaporated in the air stream;

means for conveying said humidified air to said turbine air compressor;

a water purifier, comprising:

a water evaporator heated by the hot turbine exhaust, so as to distill water supplied thereto;

a condenser disposed in the path of the wet side exhaust of the indirect evaporative heat exchanger for liquifying said distilled water vapor;

means for conveying distilled water vapor from the evaporator to the condenser; and

means for conveying liquified water from the condenser to said water spray.

4,418,528
MODULAR GAS TURBINE ENGINE

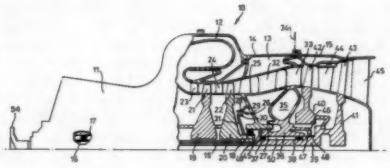
Terrence R. Pellow, Watford, England, assignor to Rolls-Royce Limited, London, England

Filed Oct. 10, 1980, Ser. No. 196,114

Claims priority, application United Kingdom, Nov. 3, 1979, 7938143

Int. Cl.³ F02C *3/10*

U.S. Cl. 60—39.161 **4 Claims**



1. A modular gas turbine engine comprising:

a gas generator module including a static portion, rotary members contained within the static portion of said gas generator module, a rotary shaft for said gas generator module and supporting said rotary members thereof, a plurality of bearings carried by the static portion of said gas generator module and supporting said rotary shaft therefrom;

a power turbine module adapted to be detachably attached to said gas generator module and including a static portion, rotary members contained within the static portion of said power turbine module, a rotary shaft for said power turbine module and supporting said rotary members thereof, a plurality of bearings carried by the static portion of said power turbine module and supporting said rotary shaft therefrom; and

a common bearing chamber defined by a portion of said gas generator module and a portion of said power turbine module, at least a downstream one of said plurality of bearings for the rotary shaft of said gas generator module and said plurality of bearings for the rotary shaft of said power turbine module being positioned within said common bearing chamber whereby when said gas generator module and said power turbine module are separated, each rotary shaft of the respective module remains fully supported by the respective plurality of bearings carried by the respective static portion.

4,418,529

FUEL SYSTEMS FOR GAS TURBINE ENGINES

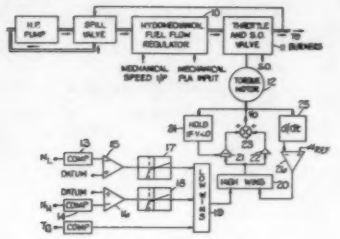
Michael J. Joby, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sep. 17, 1980, Ser. No. 188,211

Claims priority, application United Kingdom, Sep. 21, 1979, 7932879

Int. Cl.³ F02C 9/28

U.S. Cl. 60—39.281 3 Claims



1. A gas turbine engine fuel system comprising the combination of an hydromechanical speed governor fuel flow control, an electrically operable valve in series with the fuel flow control, and a control circuit connected to said electrically operable valve comprising a phase advance compensation circuit for advancing the phase of incoming signals from an engine speed transducer, said phase advance compensating circuit having input means for receiving said incoming signals, differential amplifier means connected to said phase advance compensating circuit and to a limit signal, and an amplifier connected to said differential amplifier means and having a non-linear transfer characteristic such that its amplification factor is increased significantly when the input thereto representing the error between the phase compensated speed signal and a limit signal exceeds a predetermined level, said amplifier providing an electrical output connected to and controlling said electrically operable valve.

4,418,530

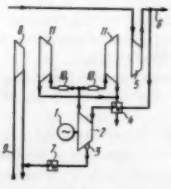
SEWER PLANT FOR COMPRESSOR STATION OF GAS PIPELINE SYSTEM

Igor S. Bodrov, Leningrad; Anatoly G. Gudz; Tatyana M. Lukianova, both of Moscow; Vladimir P. Nitskevich, Khimki; Anatoly P. Ogurtsov, Leningrad; Andrei F. Salnikov, Krasnodar; Mikhail M. Fomichev, Krasnodar; Igor V. Sherstobitov, Krasnodar, and Mikhail B. Schepakin, Moscow, all of U.S.S.R., assignors to Moskovsky Institut Khimicheskogo Mashinostroenia, Moscow, U.S.S.R.

Continuation of Ser. No. 860,975, Dec. 15, 1977, abandoned. This application May 13, 1980, Ser. No. 149,536

Int. Cl.³ F02C 6/18

U.S. Cl. 60—39.181 5 Claims



1. A power plant for a compressor station of a gas pipeline system having gas forcing devices including both a high pressure compressor in a high pressure gas main and an additional low pressure compressor in an additional low pressure gas main, the gas compressed by said high pressure compressor being brought into said high pressure gas main at a pressure higher than the pressure produced by said low pressure compressor, and gas turbine installations having combustion chambers, said power plant comprising:

an electric generator intended to meet the power requirements of said compressor station;

an expansion engine having a collection chamber provided with a discharge package and coupled with the shaft of said electric generator;

a heater for heating the gas directed to said expansion engine;

said expansion engine having an intake passage coupled through said heater with a point in said high pressure main, and having a discharge passage coupled with said combustion chambers of the gas turbine installations;

a gas cooler coupled with said discharge passage of said collection chamber for cooling the flowing gas therein; and

said collection chamber being coupled through said gas cooler with said additional low pressure gas main at a point where the pressure is lower than at said point of said high pressure main which is coupled with said intake passage of said expansion engine whereby expansion engine is capable of utilizing a pressure differential between said high and said low pressure mains to thus insure that the power plant remains operational in the event that said low pressure compressor is shutdown.

4,418,531

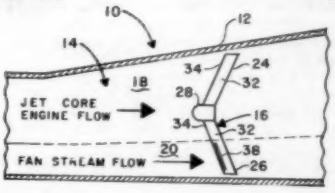
FLAMEHOLDER STABILIZATION PLATE FOR AN AIRCRAFT ENGINE AFTERBURNER SYSTEM

George W. Beal, Palm Beach Gardens, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 5, 1981, Ser. No. 318,652

Int. Cl.³ F02K 3/10

U.S. Cl. 60—261 3 Claims



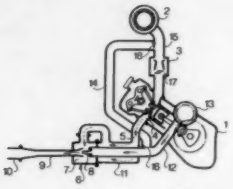
1. In an afterburner system of a turbofan engine having a hollow casing defining a fluid flow duct and an elongated flameholding baffle disposed in said casing across said duct for receiving at separate portions of its front side a hot gas stream flow from a core engine and a cold air stream flow from a fan with droplets of cool augmentor fuel entrained therein, said baffle defining a flame recirculation zone at its rear side, the improvement which comprises:

a generally planar flameholder stabilization plate attached to the portion of said baffle located substantially outside of said hot gas stream flow so as to not impede said flow but instead extend generally transversely to said baffle and across said cold air stream flow, said plate including a main body attached to said baffle and a plurality of extension tabs extending laterally from opposite sides of said body for substantially shielding said baffle from contact by said cold air stream flow and said droplets of cool fuel entrained therein so as to allow said baffle to remain at a high temperature and thus the flame held thereby in said recirculation zone to be more stable.

4,418,532
SUPERCHARGED INTERNAL COMBUSTION ENGINE HAVING A COMPRESSED AIR DRIVEN EXHAUST GAS EJECTOR

Shinroku Momose, Musashino, and Tokuichi Mizunuma, Hachioji, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,557
Claims priority, application Japan, Feb. 16, 1981, 56-21700
Int. Cl.³ F02D *23/00*; F02B *35/00*
U.S. Cl. 60—316 **1 Claim**

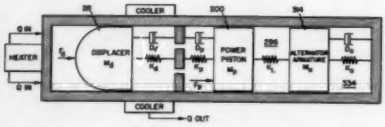


1. An intake and exhaust system of an internal combustion engine having an intake pipe and an exhaust pipe, comprising an ejector provided adjacent to said exhaust pipe, said ejector consisting of a nozzle, an exhaust pressure reducing chamber, and a suction throat pipe adjacent to said nozzle, a compressor driven by said engine, a pipe for communicating said compressor with said nozzle of said ejector, conduit means for communicating said exhaust pipe with said exhaust pressure reducing chamber, an exhaust pipe connected to said suction throat pipe, a supercharging pipe for communicating said compressor with said intake pipe, and changeover valve means provided in said supercharging pipe for communicating said compressor with said intake pipe in wide-open throttle operation and with said ejector in part-open throttle operation.

4,418,533
FREE-PISTON STIRLING ENGINE INERTIAL CANCELLATION SYSTEM

Lawrence R. Folsom, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jul. 14, 1980, Ser. No. 168,718
Int. Cl.³ F02G *1/06*
U.S. Cl. 60—520 **10 Claims**



1. A free-piston Stirling engine including a hermetically sealable vessel enclosing a working space containing a working gas and having a first end of said working space heated by a heater for heating the working gas and having a second end of said working space cooled by a cooler for cooling the working gas; said vessel also containing a displacer having a mass for shuttling the working gas between said ends through said heater, a regenerator, and said cooler to produce a periodic pressure wave in said working gas; a power piston having a mass driven in axial oscillation in said vessel to produce output power; said displacer mass and said power piston mass forming substantially a first mass in said working space; wherein the improvement comprises:

a second mass in said vessel and outside said working space;

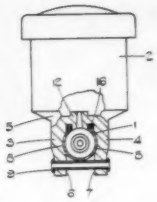
means for coupling said second mass in momentum exchange relationship with respect to said first mass; and

means for causing oscillation of said second mass in phase opposition to said first mass, whereby the shaking forces exerted by said first mass are cancelled by movement of said second mass, and the shaking forces exerted through said vessel to ground are minimized.

4,418,534
HYDRAULIC PRESSURE MASTER CYLINDER

Jurgen Dufft, Kennilworth, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 10, 1981, Ser. No. 242,261
Claims priority, application United Kingdom, Mar. 18, 1980, 8009049
Int. Cl.³ B60T *11/26*
U.S. Cl. 60—585 **3 Claims**



1. In a hydraulic master cylinder assembly comprising a cylinder having a bore therethrough, a piston operably disposed within said bore for reciprocating movement therein, at least one opening through the peripheral wall of said cylinder, a separate hydraulic fluid reservoir member removably mounted on said cylinder, a spigot on said reservoir projecting therefrom and extending into said opening so as to resist longitudinal displacement of said reservoir with respect to said cylinder, and a bore through said spigot providing a fluid flow path between the respective interiors of said reservoir and cylinder, the improvement comprising mounting and retaining arms on said reservoir and projecting therefrom to engage the peripheral outer wall of said cylinder on opposite sides thereof comprising at least one pair of spaced parallel resilient arms attached to and extending from said reservoir at least substantially beyond the central axis of said master cylinder, cylinder engaging recesses on the inner surfaces of said arms shaped to conform to the outer peripheral surface of the cylinder and extending from a position between the reservoir and the axis to a position beyond said axis to engage said peripheral surface for a distance on the side opposite said reservoir so that said arms are resiliently displaceable outwardly for insertion of the cylinder between them until the cylinder engages with the recesses by snap-engagement to securely retain said reservoir on said cylinder by the gripping force produced by the resiliency of said arms.

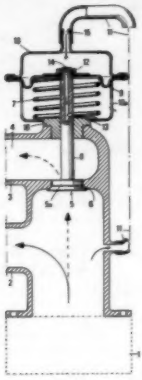
4,418,535
DEVICE FOR REGULATING THE PRESSURE OF A FLUID SUPPLIED TO A FEEDING CIRCUIT FROM A FLUID SOURCE

Andre Ecomard, Marly le Roi, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jan. 21, 1981, Ser. No. 226,983
Claims priority, application France, Jan. 21, 1980, 80 01370
Int. Cl.³ F02D *23/00*
U.S. Cl. 60—602 **7 Claims**

1. In a device for regulating fluid pressure in a utilization circuit having an inlet pipe means and an outlet pipe means, and fed with a fluid under pressure by a fluid source, the device comprising a by-pass fluid conduit connected parallel to said outlet pipe means of said utilization circuit, obturating means adapted for obturating said by-pass conduit, and control means for automatically moving said obturating means into a first open position when pressure in the utilization circuit is higher than a predetermined value, and for automatically moving said

obturating means into a second closed position when the pressure in the utilization circuit is lower than said predetermined value, the improvement wherein said control means comprises a manometric gauge connected to said fluid pressure source through a first calibrated aperture, and having a movable wall therein to define a fluid pressure receiving chamber on one side of the wall, calibrated spring means disposed on the wall, with said obturating means comprising a valve with a valve stem connected to said movable wall, and with the spring means disposed for urging said movable wall and valve stem into said second closed position, said valve stem having a second calibrated aperture, opening into said pressure receiving chamber, and into a passageway leading into the other side of the mov-



able wall for allowing pressurized fluid to pass therethrough from the fluid pressure receiving chamber to atmosphere, and passageway closing means arranged as a guide for said valve stem for closing off passage of fluid through said passageway when pressure in said pressure receiving chamber increases to a level sufficient to displace said movable wall a distance in said first open direction sufficient to close said passageway, whereby as the fluid pressure in said utilization circuit increases, an initial displacement of said movable wall is caused to close said passageway and whereupon closing of said passageway causes a sudden rise in pressure in the fluid pressure receiving chamber to cause a full opening of the valve to lower pressure in the utilization circuit by diverting a partial flow through said bypass conduit.

4,418,536

RECIPROCATING INTERNAL COMBUSTION ENGINE WITH DISCONNECTIBLE EXHAUST TURBOCHARGERS

Herbert Deutschmann, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

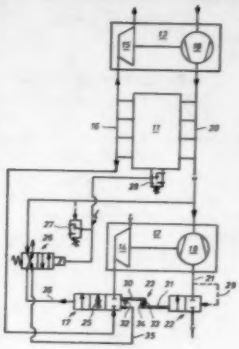
Filed Aug. 28, 1981, Ser. No. 297,508

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032435

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—602 **40 Claims**

1. A reciprocating internal combustion engine comprising a plurality of exhaust gas turbocharger means, exhaust means for directing a flow of exhaust gases to the respective gas turbocharger means, and means for slectively connecting and disconnecting at least one exhaust gas turbocharger means during a partial load operation of the engine including a blocking means arranged in the exhaust means and a further blocking means arranged in an intake means of the at least one exhaust gas turbocharger means, coupling means are provided for operatively connecting the blocking means in the exhaust means to the further blocking means so as to permit, upon a connection of the at least one exhaust gas turbocharger means, the blocking means and the exhaust means to be opened only to an intermediate position at which a rotational speed of the at least one exhaust gas turbocharger means is limited to permissi-



ble values and to permit a further opening of the blocking means in the exhaust means only one of with or after an opening of the further blocking means.

4,418,537

SUPERCHARGER FOR AN INTERNAL COMBUSTION ENGINE

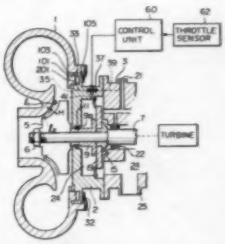
Kenzi Iwamoto, Nishio, and Makoto Kuroyanagi, Hekinan, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 9, 1981, Ser. No. 329,134

Claims priority, application Japan, Dec. 24, 1980, 55-181887

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—611 **7 Claims**



1. A supercharger apparatus for an internal combustion engine, comprising:

means for receiving the energy of the exhaust gas in an exhaust system of the engine;

a shaft connected to said means;

an impeller connected to an end of the shaft, said impeller is adapted for compressing a fluid passing through the apparatus;

a first housing in which said impeller is arranged, said housing forming a part of an intake system of the engine,

a second housing for supporting the shaft;

journal means for rotatably supporting the shaft on the second housing; and,

means for controlling a clearance formed between the first housing and the impeller so that it is changed from a minimum valve substantially equal to zero for effecting a compression of intake air to a maximum value for providing a by-pass passageway for the free passage of intake air therethrough,

wherein said means for controlling the clearance comprises

first means responsive to fluid pressure for effecting a limited relative axial movement between the first and the second housings, and second means for producing a fluid pressure directed to the first means,

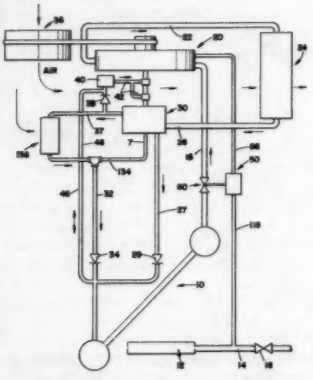
wherein one of said housings is provided with an axially outwardly opened annular groove, whereas the other one of said housings is provided with an annular projection which is axially slidably inserted into the annular groove, wherein said first means comprise stopping means for limiting the axial slide movement between a first position where the clearance attains the minimum value and a second position where the clearance attains the maximum value, and biasing means for generating a force to urge one of the housings toward one of the positions, and wherein said second means comprise a pressure chamber formed between the annular groove and the annular projection.

4,418,538

METHOD AND APPARATUS FOR OPERATING A SELF-STARTING AIR HEATING SYSTEM

Charles E. Heinrich, Mentor, Ohio, assignor to TRD Inc., Cleveland, Ohio

Filed Dec. 11, 1980, Ser. No. 215,563
Int. Cl.³ F01K *13/02*
U.S. Cl. 60—646 **5 Claims**



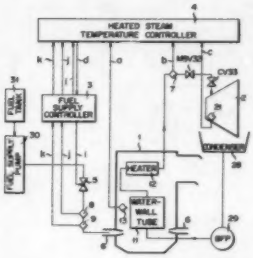
1. In a self-starting air heating system including a fuel burner fired vapor generator, a turbine, and a condenser connected in a circuit such that the vapor output from the generator is conducted to said turbine and then from an outlet from said turbine to said condenser where it is condensed and returned to said boiler, and further including an air blower means driven by said turbine for causing a flow of air over said condenser, and a condensate pump also driven by said turbine for returning the condensed vapor to the vapor generator, the improved method of operation comprising maintaining the circuit portion between said vapor generator and said turbine closed to prevent the vapor output of said vapor generator from passing to said turbine until the pressure differential between the turbine outlet and the vapor generator reaches a minimum predetermined level and after opening said portion of the circuit maintaining it open until after the flow of fuel to said fuel burner has been shut-off and restarted.

4,418,539

METHOD AND SYSTEM FOR CONTROLLING THE START OF A THERMAL POWER PLANT

Hidekazu Wakamatsu, Kodaira, and Yoichiro Kogure, Tama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 4, 1982, Ser. No. 336,704
Claims priority, application Japan, Jan. 14, 1981, 56-3238
Int. Cl.³ F01K *13/02*
U.S. Cl. 60—646 **10 Claims**



1. A method for controlling the start of a thermal power plant having a turbine, a boiler for generating superheated steam to drive the turbine, a fuel source for supplying fuel to the boiler, a fuel supply controller for controlling the fuel supply from the fuel source to the boiler, and the like, said method comprising the steps of:

supplying fuel from the fuel source to the boiler after the plant has been prepared to start;

igniting burners of the boiler thereby to raise the temperature and pressure of water flowing through water tubes of the boiler;

causing the fuel supply controller to control the fuel supply to the boiler; and

starting the supply of superheated steam from the boiler to the turbine when the superheated steam reaches a temperature which satisfies a condition for starting the turbine,

said step of causing the fuel supply controller to control the fuel supply including a step of calculating a desired temperature of combustion gas in the boiler from a process factor indicative of the start mode of the turbine, a step of calculating a process quantity of the fuel supply controller from a difference between the desired temperature of combustion gas calculated and the temperature of the combustion gas detected in the boiler, and a step of operating the fuel supply controller according to the process quantity calculated, thereby controlling the fuel supply from the fuel source to the boiler.

4,418,540

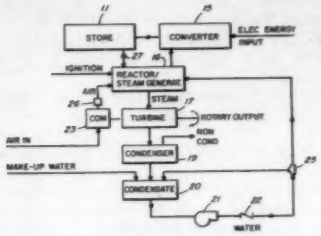
POWER SYSTEM AND METHOD

Hagop Kasparian, P.O. Box 172, Al Khobar, Saudi Arabia, and Kaspar Kasparian, P.O. Box 58252, Raleigh, N.C. 27658

Filed Apr. 14, 1980, Ser. No. 140,294
Int. Cl.³ F01K *25/00*
U.S. Cl. 60—649 **3 Claims**

1. A power system comprising a store of aluminum, a reactor for said aluminum, means to present said aluminum to said reactor, means to introduce steam into said reactor whereby said aluminum is converted to aluminum compound with the

consequent release of energy, means to heat the steam with said released energy, a steam operated power device and



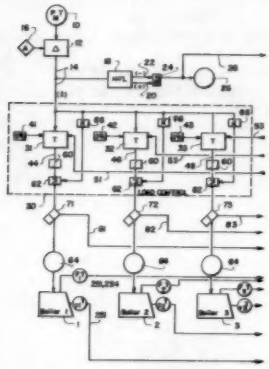
means to operate said device with the heated steam, and means to convert said aluminum compound back to aluminum.

4,418,541

BOILER LOADING SYSTEM

Thomas D. Russell, Montville, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 11, 1982, Ser. No. 357,006
Int. Cl.³ F01K *13/02*
U.S. Cl. 60—667 **5 Claims**



1. A boiler loading method for a power plant having a plurality of boilers and operable at a desired load, the plant having an actual plant load and each boiler having an actual boiler load, comprising:

sensing an actual plant load;

comparing the actual plant load with the desired plant load to generate a plant load change signal representing one of a plant load increase demand and a plant load decrease demand;

monitoring each actual boiler load;

determining a change in efficiency of each boiler with an incremental change in boiler load from each actual boiler load respectively, to establish an efficiency increase for each boiler load incremental increase and an efficiency decrease for each incremental boiler load decrease;

selecting the one of said boilers with the highest efficiency increase upon the occurrence of a plant load increase demand and the one of said boilers with the lowest efficiency decrease upon the occurrence of a plant load decrease demand; and

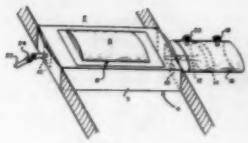
loading the one of said boilers which is selected by an amount corresponding to the plant load change signal for satisfying the one of the plant load increase demand plant load decrease demand.

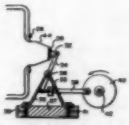
4,418,542

VEHICULAR THOROUGHFARES FOR POWER GENERATION

Robert D. Ferrell, 26 Jaeger Dr., Old Brookville, N.Y.

Filed Feb. 4, 1981, Ser. No. 231,537
Int. Cl.³ F04B *9/10, 35/02;* **F03G** *5/00*
U.S. Cl. 60—668 **10 Claims**





1. A roadway of the type over which moving vehicles pass, said roadway having positioned in the path of the movement of such vehicles a power generating means for generating power in response to movement of said vehicles over said roadway, said power generating means being in the form of an elastic compressible and deformable container which contains a fluid, said power generating means being responsive to and actuated by the weight of said vehicle as it passes thereover, said power generating means further comprising a vertically displaceable, generally planar member generally coplanar with the roadway, said power generating means comprising said fluid housed in a fluid housing, said fluid being in fluid communication with a generator via transmission means, said fluid while in said housing being in contact with a displaceable bearing surface which when displaced acts upon said fluid, said displaceable bearing surface in turn connected to said generally planar member, said container responsive to the weight of said moving vehicle, said container comprising a body portion disposed vertically beneath said generally planar member, said body portion connected to a neck member in fluid communication with the fluid in said container, said neck member containing a diaphragm portrudable from said body to engage said transmission means whereby when a motor vehicle passes over said generally planar surface, the same is vertically displaced whereby to displace said bearing surface against said fluid whereby said container is deformed and the fluid contained therein is displaced to engage said transmission.

4,418,543

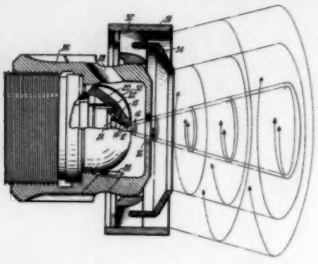
FUEL NOZZLE FOR GAS TURBINE ENGINE

Joseph E. Faucher, East Hartford; Richard R. Wright, Willimantic; Francis C. Pane, Jr., South Windsor; David Kwoka, Windsor, and Edmund E. Striebel, South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 2, 1980, Ser. No. 212,176
Int. Cl.³ F02C *7/22*
U.S. Cl. 60—742 **2 Claims**

1. A dual orifice type fuel nozzle having a primary fuel passage normally continuously operative throughout the en-

gine operating envelope and a secondary fuel passage normally operative solely during the high thrust regimes and inoperative during the low thrust regimes of said engine operating envelope, for a combustor of gas turbine engine having a compressor, said fuel nozzle having a generally conically shaped casing with a primary fuel passage centrally disposed therein, secondary fuel passage formed therein concentrically disposed relative to the primary fuel passage, both primary and secondary passages exiting fuel into said combustor through a substantially mutual transverse plane, means for imparting a swirl component to compressor discharge air surrounding the fuel



exiting from said primary and secondary passages, means for pressurizing the secondary passage when said primary passage is solely operative with said compressor discharge air whereby said secondary passage maintains a positive pressure for preventing fuel from said primary passage from migrating therein and coking the walls of said secondary passage, first fuel swirl means in said primary passage for imparting a swirl motion to the fuel issuing therefrom, second fuel swirl means in said secondary passage for imparting a swirl motion to the fuel issuing therefrom, said first fuel swirl means, said second fuel swirl means and said means for swirling the air imparting swirling motion in a common direction.

4,418,544

PUMP FOR VERY COLD LIQUIDS

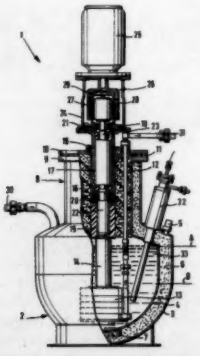
Helmut Heybutzki; Wolfgang Krug, and Johann Seferiadis, all of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH

Filed Jun. 28, 1982, Ser. No. 392,652

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126293

Int. Cl.³ F17C *13/00*

U.S. Cl. 62—55 **12 Claims**



1. Pumping apparatus for very cold liquids comprising:

a thermally insulated and pressure-tight sealed vessel having a thermally insulated neck **(8)** and equipped with an inlet and an outlet respectively for introduction and removal of a very cold liquid;

an immersion-type rotary pump **(13)** mounted on suspension means through said neck of said vessel for operation when immersed in very cold liquid in said vessel, and connected directly to one of said inlet and outlet and to the interior of said vessel;

a drive-shaft **(19)** for said rotary pump passing through said vessel neck and through said suspension means for said pump;

bearings **(20,21)** for said drive-shaft held by said suspension means;

thermal insulation means interposed in said drive shaft and in said pump suspension means for opposing heat flow down the neck of said pump, including an insulation **(23)** on the pump side of said bearings **(20,21)** and

means for pressure-tight sealing of said neck **(8)** of said vessel. in the form of a seal cap **(29)** covering the end portion of said drive shaft **(19)** remote from said pump;

a permanent magnet coupling **(20)** for transfer of torque to said drive shaft **(19)** through said cap **(29)**, connected above said cap to a motor shaft coaxial with said drive shaft;

a motor **(25)** outside said vessel for driving said motor shaft and thereby said drive shaft.

4,418,545

REABSORPTION METHOD FOR TEMPERATURE TRANSFORMATION OF HEAT AND APPARATUS THEREFORE

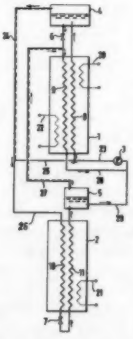
Dieter Markfort, Am Tor 2, 5064 Rösrath 3, Fed. Rep. of Germany

Filed Jan. 6, 1982, Ser. No. 337,398

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1981, 3100348

Int. Cl.³ F25B *15/00*

U.S. Cl. 62—101 **15 Claims**



1. In a reabsorption process for transforming low-temperature heat into medium temperature heat by utilizing the energy of high temperature heat, incorporating two fluid loops wherein solutions of a working agent and a solvent are passed through, the working agent is desorbed from the solution in the first loop within a desorber, the latter being a component of the high pressure side of the first loop, and reabsorbed by the solution in the second loop within a reabsorber, the latter being a component of the high pressure side of the second loop, and after depressurization is desorbed from the solution in the second loop within a degasser, the latter being a component of the low pressure side of the second loop, and absorbed by the depressurized solution of the first loop within an absorber, the latter being a component of the low pressure side of said first loop, the improvement, whereby a difference in characteristic

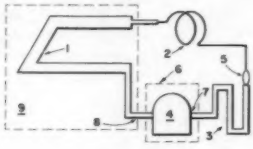
temperature levels is covered by variation of solution concentration, with only minor pressure differences, utilizing the principles of non-adiabatic, differential desorption and adsorption, comprising, combining the desorber and absorber to form a first integrated unit, combining the reabsorber and degasser to form a second integrated unit each of them having internal thermal contact, joining said two separate solution loops into one duct upstream of a common solution pump, maintaining solutions of both loops at identical pressure, temperature and concentraction at the exits of the absorber and degasser, and diverging said common duct downstream of said pump.

4,418,546

CONTINUOUS TUBE REFRIGERATION SYSTEM

Harrie R. Buswell, 2646 Rhonda Ct., Duluth, Ga. 30136

Filed Mar. 25, 1982, Ser. No. 322,257
Int. Cl.³ F25B *1/00*
U.S. Cl. 62—115 **6 Claims**



1. A method for providing the refrigerant path in a refrigeration system, said refrigeration system comprising a compressor, said compressor having an output port, a condenser arranged for receiving refrigerant from said output port and dissipating heat from said refrigerant, restriction means arranged for receiving refrigerant from said condenser, an evaporator arranged for receiving refrigerant from said restriction means and allowing said refrigerant to expand and absorb heat, said compressor having an input port for receiving refrigerant from said evaporator, said method including the steps of providing a single, integral length of tubing having a given diameter, forming a first portion of said length of tubing to provide a fluid passageway therethrough of less than said given diameter and having fins extending from said fluid passageway for providing said condenser, forming a second portion of said length of tubing to provide a capillary tubing for providing said restriction means, said first portion and said second portion being in communication through said length of tubing, forming a third portion of said length of tubing for providing a fluid passageway therethrough of less than said given diameter and having flattened portions extending therefrom for providing said evaporator, said second portion and said third portion being in communication through said length of tubing, connecting one end of said length of tubing to said output port of said compressor, and connecting the other end of said length of tubing to said input port of said compressor, so that said refrigerant path is provided by said single, integral length of tubing.

4,418,547

THERMALLY POWERED HEAT TRANSFER SYSTEMS

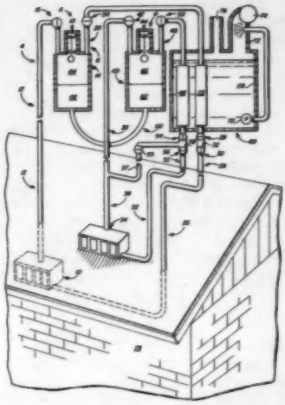
Robert W. Clark, Jr., Phoenix, Ariz., assignor to The Saint E. Company, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 214,458, Dec. 8, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 413,095
Int. Cl.³ F25B *1/00*
U.S. Cl. 62—116 **14 Claims**

1. A thermally powered heat transfer system having a first and a second cycle of operation, comprising:

first and second closed loop heat transfer means each of said transfer means including respectively a first and a second refrigerant, a first and a second condenser means for transferring heat from the first and second refrigerants to a first and a second heat sink, and a first and a second heat exchanger for transferring heat from a first and a second heat source to the first and the second refrigerants;

compressor means for said first and second transfer means powered by energy derived from the first heat source for causing said second condenser means to transfer heat from



the second refrigerant to the second heat sink during each first cycle of operation and powered by energy derived from the second heat source for causing said first condenser means to transfer heat from the first refrigerant to said first heat sink during each second cycle of operations; and

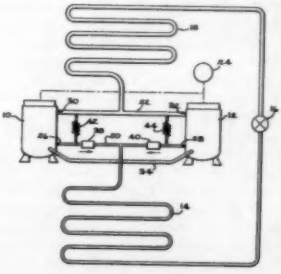
control means for causing such system to change its cycle of operation.

4,418,548

VARIABLE CAPACITY MULTIPLE COMPRESSOR REFRIGERATION SYSTEM

George N. Sawyer, Flint, Tex., assignor to Trane CAC, Inc., La Crosse, Wis.

Filed Mar. 29, 1982, Ser. No. 362,830
Int. Cl.³ F25B *7/00, 1/00*
U.S. Cl. 62—175 **8 Claims**



1. A multiple compressor refrigeration system including at least two hermetic shell compressors, each having a discharge system for discharging high pressure refrigerant and a suction system for returning low pressure refrigerant to said compressor, a discharge manifold means interconnecting the discharge systems of said compressors, and suction manifold means interconnecting the suction systems of said compressors arranging said compressors in parallel, a first heat exchanger connected to said suction manifold intermediate said suction system openings and a second heat exchanger connected to said discharge

manifold intermediate said discharge system openings, comprising:

control means for energizing one of said compressors in response to a first condition, and another of said compressors, in response to a second condition and both of said compressors in response to a third condition;

refrigerant flow control means including a check valve associated with the discharge system of each of said compressors, that includes a sealing member movable within a valve body, said check valve being operable for permitting high pressure refrigerant flow between the discharge system of its associated compressor and said discharge manifold when said compressor is energized and for preventing high pressure refrigerant present in said discharge manifold when another one of said compressors is energized from entering the discharge system of said associated compressor when it is de-energized; and

bleed means arranged between each of said check valves and its associated compressor, said bleed means comprising a bleed valve member connected to the check valve sealing member, and operable when actuated thereby to bleed refrigerant present in the discharge system of its associated compressor to said suction manifold.

4,418,549

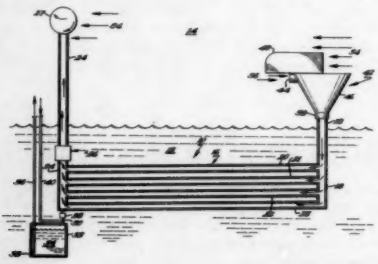
APPARATUS FOR EXTRACTING POTABLE WATER

Calice G. Courneya, Rte. 7, Alexandria, Minn. 56308

Continuation of Ser. No. 215,967, Dec. 12, 1980, Pat. No. 4,351,651. This application Sep. 28, 1982, Ser. No. 425,356

Int. Cl.³ F25D *23/12*

U.S. Cl. 62—260 **5 Claims**



1. Apparatus for extraction of potable water from moisture-laden atmospheric air, comprising, in combination: cold heat exchanger in temperature communication with the subsurface media of earth and providing for passage of moisture-laden air therethrough and providing for the extraction of water from such moisture-laden air by passive cooling of the air to or near the dew point of the air causing the water in the air to condense; air entrance means in air communication with the atmosphere and in air communication with the cold heat exchanger for providing moisture-laden air from the atmosphere to the cold heat exchanger; air exit means in air communication with the cold heat exchanger and in air communication with the atmosphere for providing moisture-drained air from the cold heat exchanger to the atmosphere; means for causing air flow from the atmosphere, through the cold heat exchanger and back to the atmosphere; a reservoir in fluid communication with the cold heat exchanger to collect water condensed out of the moisture-laden air in the cold heat exchanger; wherein the means for causing air flow through the system comprises a turbine arranged in air communcation with the termination of the air exits means and operably communicating with the atmosphere for providing a wind driven source of pressure for the system; wherein the air exit means includes an air restrictor which restricts the flow of air to a greater degree as the temperature of the exhaust air through the exit means increases and/or restricts the flow of air to a greater degree as the velocity of the exhaust air through the exit means increases; and wherein the air restrictor restricts the flow of air dependent on both the temperature and velocity of the exhaust air through the exit means to increase the residence time of the air passing through the cold heat exchanger so that the air flow does not exceed the heat exchanger capability and to maximize the amount of water condensed in the cold heat exchanger.

4,418,550

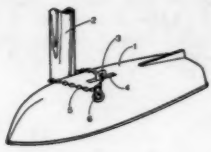
BOAT LOCKING DEVICE

James Hamilton, 189 Upland Rd., Cambridge, Mass. 02140

Filed May 13, 1981, Ser. No. 263,139

Int. Cl.³ E05B *73/00*

U.S. Cl. 70—18 **9 Claims**



1. A locking system for securing a boat having a centerboard slot against theft or unauthorized movement comprising:

a metal locking member having an elongated portion shaped and sized to project through said slot with each end of said portion extending beyond the ends of said slot, one end of said portion having means extending outwardly a distance greater than at least one dimension of said slot to prevent movement of said elongated portion entirely through said slot, means forming an opening at the other end of said portion through which a cable may be secured, and an elongated cable extending through said opening with means for securing said cable in a loop, about an immoveable object and to said locking member.

4,418,551

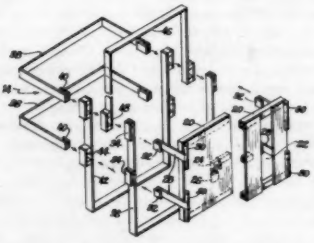
VENDING MACHINE SECURITY CAGE

Donald G. Kochackis, 95 E. Prospect St., Chula Vista, Calif. 92011

Filed Jul. 6, 1981, Ser. No. 280,729

Int. Cl.³ E05B *13/00, 17/14, 67/38;* E05C *19/18*

U.S. Cl. 70—18 **5 Claims**



1. A protective barrier assembly for a vending machine cash box comprising:

(a) a strap structure engaged around portions of said vending machine and defining stable mounting positions adjacent the opposite sides of the vending machine front;

(b) a door mounted to one of said mounting positions, and being moveable between an open mode exposing the front of said vending machine and a closed mode protecting at least a portion of the front of said vending machine;

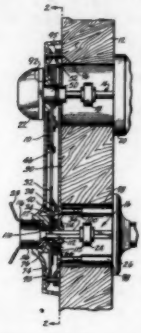
(c) means locking said door securely in the closed position; wherein said door is one of two doors respectively hinged to

said mounting positions and said locking means includes a bar passing behind both doors.

4,418,552
SIMULTANEOUSLY LOCKING AND UNLOCKING DEAD BOLT AND LOCK LATCH WITH PANIC UNLOCKING

Roger J. Nolin, 1838 Whitehurst Dr., Monterey Park, Calif. 91754

Continuation-in-part of Ser. No. 86,945, Oct. 22, 1979, Pat. No. 4,276,760. This application Jul. 1, 1981, Ser. No. 279,590
Int. Cl.³ E05B *17/04, 59/02, 63/14;* **E05C** *15/02*
U.S. Cl. 70—107 **17 Claims**



1. An improvement in a lockset of the type having an escutcheon mounting a dead bolt assembly and a latch bolt assembly, the dead bolt assembly having inside and outside operators to extend and retract the dead bolt through a dead bolt drive upon locking and unlocking either of the dead bolt operators, the latch bolt assembly having inside and outside operators to extend and retract the latch bolt through a latch bolt drive upon operation of either of the latch bolt operators, the improvement comprising:

(a) a slide mounted in the escutcheon for movement towards and away from the dead bolt assembly and with such movement away and toward the latch bolt assembly between a first position of the slide and a second position of the slide, respectively;

(b) means to bias the slide towards its first position proximate the latch bolt assembly and remote from the dead bolt assembly;

(c) a lock release mounted in the escutcheon for movement between a first position of the lock release and a second position of the lock release, respectively;

(d) crank means coupled to the dead bolt assembly for rotation between a crank locked position and a crank unlocked position, corresponding to a locked dead bolt and an unlocked dead bolt, respectively, the crank means during its movement from its locked to its unlocked position engaging the lock release and moving the lock release to its first position from its second position, the crank means in its unlocked position maintaining the lock release in its first position;

(e) means of the lock release to engage the slide and move the slide to its first position during movement of the lock release from its second position to its first position in response to rotation of the crank means between its locked position and its unlocked position, such means thereafter maintaining the slide in its first position;

(f) a latch actuator in the escutcheon and secured to the latch bolt drive for rotation therewith, the inside operator of the latch bolt drive being engageable with the actuator to rotate it and open the latch bolt;

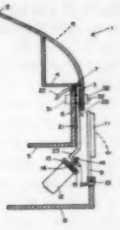
(g) means for locking the slide and the latch actuator against relative rotation when the slide is in its second position and in response to the bias means; and

(h) cam means on the inside operator of the latch bolt assembly engageable with the slide to move the slide and release the lock means and move the crank means to its unlocked position upon rotation of the inside operator.

4,418,553
VEHICLE FUEL CAP LOCKING DEVICE

Edward R. Applegate, 520 S. Dennis Ave., Decatur, Ill. 62522

Filed Sep. 9, 1980, Ser. No. 185,524
Int. Cl.³ B65D *55/02;* **E05B** *65/12;* **E05C** *19/18, 21/00*
U.S. Cl. 70—164 **2 Claims**



1. In a locking device for use with a vehicle having a trunk compartment and a fuel tank filling tube inlet located adjacent to and below a vertical lower wall of said trunk compartment, wherein said trunk compartment has a lid element which is pivotally mounted to disengage from said trunk compartment lower wall, when said trunk is opened, and engage said trunk compartment lower wall, when said trunk is closed, and wherein said lid element has an interior wall section which normally is positioned above said trunk compartment lower wall, when said trunk lid is in the closed condition, the improvement comprising:

(1) a removeable cap closure member for said fuel tank filling tube inlet, said cap member being adapted to be placed and tightened onto said filling tube inlet by rotation of said cap member, and said cap member having a slot provided on the exterior thereof adapted to receive a bar element, and

(2) a locking bar element having configured, joined upper and lower portions,

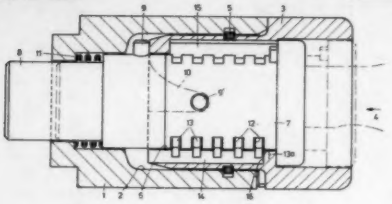
said upper portion of said bar element extending (a) from its lower end at a point adjacent said filling tube inlet, (b) past, along, and adjacent to said trunk compartment lower wall, and (c) in and then downwardly along a non-linear path around the top of said trunk compartment lower wall, to be adapted thereby to engage and abut said interior wall section of said trunk lid, when said lid is in a closed condition, and

said lower portion of said bar element having a lower terminus adapted to be slideably received within said slot in said cap member to retain, when so received, said cap member against rotational movement and against removal from said filling tank inlet, whereby said cap member is adapted to be locked in place on said filling tank inlet.

4,418,554
KEY OPERATED LOCKING MECHANISM

Günter Wolfgang, Wuppertal, Fed. Rep. of Germany, assignor to Neiman S.A., Courbeovie, France

Filed Sep. 15, 1981, Ser. No. 302,005
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1980, 3035172
Int. Cl.³ E05B 29/02
U.S. Cl. 70—360 7 Claims

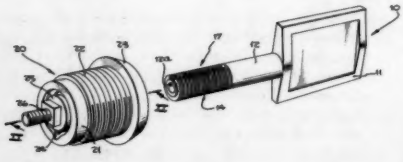


1. A key operated locking mechanism comprising:
(a) a cylinder housing;
(b) an axially displaceable cylinder core which rotates in a cylindrical opening in the cylinder housing and which is movable axially between a locking position and an unlocking position,
(c) a locking bolt movable by said core between locking and unlocking positions, and
(d) plate tumblers on said core which project, in the axially displaced locking position of the cylinder core, beyond the external surface thereof when the key has been withdrawn, wherein in the cylindrical opening in the cylinder housing there is provided at least one contact surface, which is arranged so as to be transverse of the lock axis and is directed towards the locking bolt, for co-operation with a portion of at least one of said plate tumblers that surmounts the cylinder core surface at a point with which the surmounting portion is in abutting contact in the axial position of the cylinder core in which the locking bolt is in its locking position, said contact surface closing a tumbler recess means formed longitudinally in said cylinder housing, into which the recess means plate tumblers project in the locking position when the key has been removed, at the key introduction end, said recess means being open in the direction of the locking bolt.

4,418,555
CYLINDER TYPE LOCK AND KEY

Tim M. Uyeda, South San Gabriel, Calif., assignor to La Gard, Inc., Torrance, Calif.

Filed Feb. 5, 1982, Ser. No. 346,131
Int. Cl.³ E05B 29/02
U.S. Cl. 70—366 8 Claims

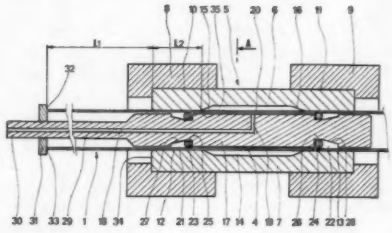


1. In a cylindrical type lock having a rotatable cylinder within a lock body, said cylinder having a plurality of gated tumbler wheels rotatable therein, and a fence member interposed between said cylinder and body and moveable toward the gates of said tumbler wheels whereby rotation of said cylinder relative to said body is normally prevented unless said fence member is received into each of the gates of said tumbler wheels, the improvement comprising the provision of:
a stacked array of a plurality of nested and alternating tumbler wheels and spacer discs wherein said wheels and discs are each provided with identically configured annular projections on one side thereof and annular recesses on an opposite side thereof, said annular recesses being of sufficient size to receive a projection of an adjacent wheel or disc to place the same in a nested relation.

4,418,556
PRECISION LOCAL EXPANSION SHAPING PROCESS AND APPARATUS FOR METAL TUBES OF SUBSTANTIAL LENGTH

Serge Galle; Jerome Hautdidier, both of Montreuil-Juigne, and Christian Soulet, Ugine, all of France, assignors to Compagnie Europeenne du Zirconium Cezus, Paris, France

Filed Jul. 12, 1982, Ser. No. 397,217
Int. Cl.³ B21D 22/10
U.S. Cl. 72—62 7 Claims



1. Apparatus for local expansion shaping in a precisely located region of a running part of a cylindrical tube of substantial length, said apparatus comprising a dismantable tubular die open at both ends and including a central expansion chamber, the inside dimensions of which correspond to those of the expanded region to be produced, and, to opposed sides of the expansion chamber, two cylindrical bearing surfaces, the inside diameters of which are substantially equal to the initial outside diameter of the tube to be expanded for an accommodation of the tube within the die; and a mandrel for reception within the die-received portion of the tube, said mandrel including an internal conduit having one end adapted for communication with an external pressure fluid source and a second end laterally directed at a point along the length thereof for communication with, and introduction of pressurized fluid to, an annular space between the mandrel and the tube, said mandrel having compressible seals mounted thereabout at spaced points therealong for sealing engagement with the tube to delimit said annular space between the mandrel and the tube to extend beyond the opposed sides of the expansion chamber into the areas of the cylindrical bearing surfaces of the die; said mandrel including annular grooves thereabout, said grooves being positionable to the opposite sides of the annular space and housing said seals, the grooves being of a transverse width greater than the seals received therein, ech groove transversely extending between an inner side toward the annular space and an outer side outwardly spaced relative to the annular space, each of said annular grooves being variable in depth from a maximum depth at the inner side to a minimum depth at the outer side, each seal being of a height greater than the maximum depth of the corresponding groove and capable of increasing compression between the mandrel and tube upon outward movement of the seal in response to pressure increase in the annular space.

4,418,557

MAKING A SEAMLESS SPHERICAL CASE

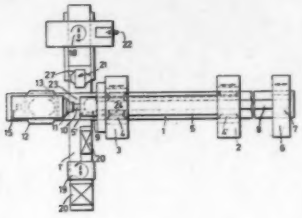
Clemens Halene, Duesseldorf, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 97,458, Nov. 26, 1979, Pat. No. 4,312,206. This application Jul. 2, 1981, Ser. No. 279,864

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851620

Int. Cl.³ B21D *22/16*

U.S. Cl. 72—69 7 Claims



1. A machine for making a spherical case with a cylindrical extension having a support, comprising:

a linear bed;

head stock means slidably disposed on the bed for holding a tubular blank;

a mandrel rod with a head held in the support, there being a pin extending from the head;

receiver means on the bed for receiving the pin, at least one of the receiver means and of the mandrel support being also slidably disposed on the bed;

a contoured work tool and rolling means;

a heating means;

said tool and rolling means and said heating means being disposed adjacent to the bed for being individually advanced from different directions transversely to the bed and towards the blank when held by the stock means, said contoured work tool and rolling means coacting with the mandrel rod and the head for working the tubular blank stepwise into a spherical case with end nipple; and

means for rotating the blank when held by the head stock means during the heating by the heating means and during subsequent rolling by the tool means.

4,418,558

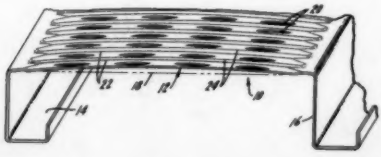
METHOD OF MANUFACTURE OF VENTILATED SHEET METAL FLOOR MEMBERS

Robert A. Simmons, Deerfield, Ill., assignor to Bantam Systems, Inc., Chicago, Ill.

Filed Jul. 27, 1981, Ser. No. 287,291

Int. Cl.³ B21D *35/00*

U.S. Cl. 72—177 3 Claims



1. The method of manufacture of sheet metal floor members for use in a grain storage bin or like application requiring passage of fluid through the floor members without permitting passage of granular material therethrough, comprising the following steps:

A. roll lancing a strip of sheet metal to form a series of short closed slits in the central portion of the strip with the strip of sheet metal being fed into the rolls in the direction of its length and all of the slits extending in a common direction transverse to the length of the strip;

B. and subsequently roll forming the sheet metal strip to form a series of transverse corrugations in the central portion of the strip parallel to the slits, so that the central portion of the strip is stretched longitudinally and the slits are thereby opened sufficiently to afford multiple narrow, open ventilation slots that allow free passage of fluid while precluding passage of granular material therethrough, simultaneously ironing out projections formed by the lancing of step A;

steps A and B being performed sequentially in successive stages of a roll forming machine.

4,418,559

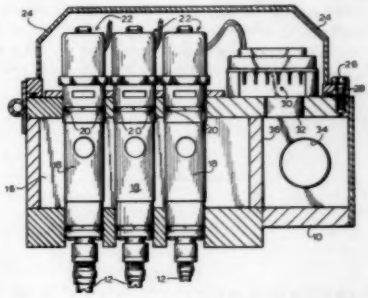
ROLL COOLANT DISTRIBUTION HEADER

Paul E. Huzyak, Salem, Ohio, assignor to Gulf & Western Manufacturing Co., Southfield, Mich.

Filed Dec. 8, 1981, Ser. No. 328,555

Int. Cl.³ B21B *45/02*

U.S. Cl. 72—201 16 Claims



1. A roll coolant distribution assembly comprising:

a header;

a chamber defined within said header;

a plurality of two-stage valves mounted to said header, portions of said valves being positioned within said chamber;

each of said valves including an inlet, an outlet, and means for controlling the passage of coolant from said inlet to said outlet, said inlet positioned within said chamber;

a plurality of nozzles extending from said chamber, said valve outlets each being connected to one of said nozzles;

said valves each including a solenoid for actuating said controlling means, said solenoids being positioned outside the header and sealed from said chamber; and

a cover secured to said header, said cover and said header defining an enclosure for said solenoids.

4,418,560

SHELL LAYER WRAPPING MACHINE AND METHOD OF POSITIONING VESSEL SECTIONS OF A MULTI-LAYER VESSEL

Raymond E. Pechacek, Houston, Tex., assignor to Hahn & Clay, Houston, Tex.

Filed May 11, 1981, Ser. No. 262,293

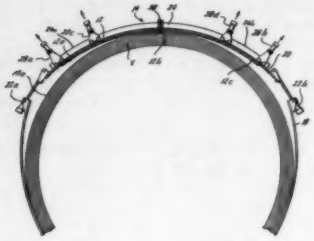
Int. Cl.³ B21D *11/02, 31/00*; B23D *11/02*

U.S. Cl. 72—296 9 Claims

1. A wrapping machine used in constructing layered vessels having at least one layer formed of adjoining vessel sections which are welded onto an inner layer and to adjoining vessel sections only after being positioned and pressed into position by such wrapping machine, which comprises:

band means adapted to encircle the layered vessel for positioning and pressing a vessel section onto a vessel layer therebelow;

said band means having a first arcuate band portion and a second arcuate band portion, said first and said second band portions being joined by tensioning means for applying force to draw said first band portion towards said second band portion; and



selective radial positioning means attached to said second band portion for selectively placing all or only a part of said second band in pressure engagement with said vessel section in order to selectively press said vessel section into radially directed engagement with such vessel layer therebelow.

4,418,561

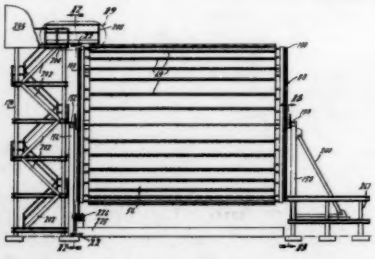
APPARATUS FOR MANUFACTURE OF TUNNEL TUBES

Edward Johnston, Newark, Del.; Morton Jacobs, Houston, Tex.; Melvin E. Miller, Havre de Grace, Md., and Robert A. Kaucic, Newark, Del., assignors to Amca International Corporation, Hanover, N.H.

Filed Apr. 23, 1981, Ser. No. 256,710

Int. Cl.³ B21J *7/20*

U.S. Cl. 72—406 **20 Claims**



1. An apparatus for use in the manufacture of generally cylindrical shells for tunnel tubes, said apparatus comprising a fixture generally cylindrical in shape and having means thereon for roll-forming plate material therearound into a generally cylindrical shell, said fixture further having at least one cable channel on an end, pedestal means for supporting said fixture, and winch means positioned at said one end of said fixture having cable means wrapped around said cable channel for rotating said fixture on said pedestal means in order to roll said plate material therearound.

4,418,562

CONTROL DEVICE FOR A SMALL PRESS

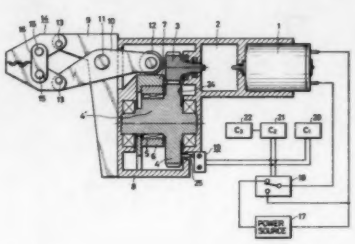
Yasuharu Sakai; Nobuaki Murai, and Kiyotaka Nakano, all of Kyoto, Japan, assignors to Japan Storage Battery Company Ltd., Kyoto, Japan

Filed Feb. 26, 1982, Ser. No. 352,982

Claims priority, application Japan, Mar. 2, 1981, 56-30097

Int. Cl.³ B21B *45/02*

U.S. Cl. 72—444 **8 Claims**



1. In a small press in which a rocking lever is rockably mounted on a fulcrum shaft extending from a stationary lever, and is rocked by a cam which is formed on a side of a power transmission gear driven by an electric motor, and in which a pressing or cutting die assembly is coupled through shafts to the front end portions of said rocking lever and said stationary lever, a control device comprising: position detecting means for detecting an operating cycle of said cam, over-current detecting means for detecting an abnormal load on said motor, delay means inhibiting said over-current detecting means during a time wherein a start current flows in said motor, and power switch means for said motor, said power switch means interrupting the flow of current to said motor in response to a signal from said position detector indicating completion of one operating cycle, or a signal from said over-current detecting means indicating an abnormal load on said motor.

4,418,563

METHOD OF DETERMINING THE IMPACT FRACTURE TOUGHNESS K_{ID} BY MEANS OF IMPACT TESTS

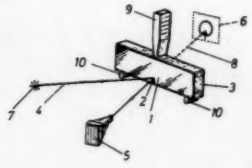
Jörg F. Kalthoff, Bad-Krotzingen, and Siegfried Winkler, Freiburg, both of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung, Munich, Fed. Rep. of Germany

Filed Nov. 13, 1981, Ser. No. 321,144

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 3044841

Int. Cl.³ G01N *3/08*

U.S. Cl. 73—12 **6 Claims**



1. A method of determining the impact fracture toughness K_{Id} of construction materials by applying impact tests to bend specimens, each having a notch therein which is subsequently extended by loading said specimen to form an artificial crack therein, comprising the steps of:

(a) determining according to the shadow optical method of

caustics the impact response curve for a particular loading arrangement and specimen geometry;

(b) measuring by an impact test the time to fracture t_f of a corresponding specimen made of a material to be tested, and

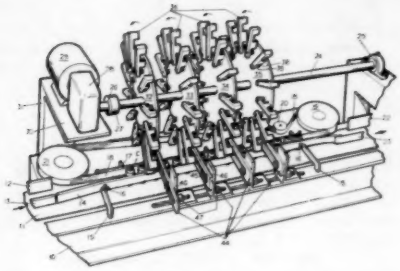
(c) ascertaining from the time to fracture with the aid of the impact response curve the impact fracture toughness K_{Id} of the construction material of the bend specimen.

4,418,564

SNAP ACTION BOTTLE FINISH TESTER AND METHOD

John A. McKinley, Clarion, Pa., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 21, 1981, Ser. No. 332,410
Int. Cl.³ G01N *3/34*
U.S. Cl. 73—12 **11 Claims**



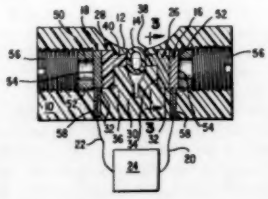
1. Apparatus for testing glass containers to determine whether the finish thereof is weak or acceptable comprising a conveyor for moving a series of containers into a test zone, a pair of opposed guide rails overlying said conveyor for guiding containers, in series, through the test zone, a horizontally driven belt positioned between one of said guide rails and the side of the containers for moving the containers through the test zone, at least four spring loaded impact fingers spaced along said conveyor in said test zone, and means for releasing said fingers successively into contact with the finish of the containers at circumferentially spaced intervals therearound.

4,418,565

ULTRASONIC BUBBLE DETECTOR

Peter A. St. John, Adelphi, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 3, 1980, Ser. No. 212,653
Int. Cl.³ G01N *29/02*
U.S. Cl. 73—19 **7 Claims**



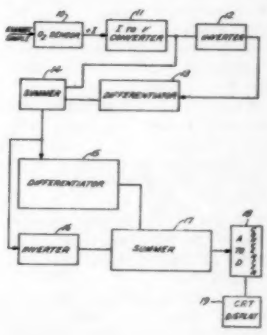
1. In ultrasonic bubble detection apparatus, a one-piece, rigid housing made of glass-filled polytetrafluoroethylene, a channel defined in the one-piece housing for receiving flow tubing in which bubbles are to be detected; first ultrasonic sending transducer means positioned in said housing on one side of the channel; second ultrasonic receiving transducer means positioned on the other side of said channel, said sending and receiving transducer means being of the type for respectively sending and receiving ultrasound energy at a frequency of 1 to 3 MHz; aperture means respectively communicating between each of said first and second transducer means and said channel, said aperture means being filled with an elastomeric material capable of transmitting ultrasound energy between said channel and each transducer means; electric lead means communicating from each transducer means to the exterior of said housing, and added air-containing slot means positioned in the bottom of said channel of a width too small to contain the tubing positioned within said channel and being of a depth extending below the lower edge of each of said transducer means, to hinder the propagation of ultrasound energy through said housing from the first to the second transducer by a route other than one passing through said elastomeric material, whereby tubing inserted in said channel may be in contact with said elastomeric material to provide transmission of ultrasound energy between the first and second transducers, which transmission of ultrasound energy is significantly altered by the presence of a bubble in the tubing, when compared with said tubing completely filled with liquid.

4,418,566

GAS ANALYZING TECHNIQUES

James E. Beck, Des Plaines, and Arvind M. Patel, Chicago, both of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed Jan. 25, 1982, Ser. No. 342,606
Int. Cl.³ G01N *27/00*
U.S. Cl. 73—23 **6 Claims**



1. In a system for analyzing the concentration of a predetermined gas by use of a sensor means for generating a sensor signal having a sensor value proportional to the partial pressure of the predetermined gas after a predetermined time period, improved apparatus for anticipating the amount of the concentration before the time period expires comprising:

signal processing means for generating a resulting signal proportional to the sum of the sensor value, another value proportional to the first derivative of the sensor value and a third value proportional to the second derivative of the sensor value, the signal processing means further comprising filter means for attenuating at a first rate signals having a frequency below a first cut off frequency, for attenuating at a second rate signals having a frequency above a second cut off frequency and for attenuating at a third rate signals having a frequency above a third cut off frequency greater than the second cut off frequency, and

display means for displaying information related to the concentration based on the resulting signal.

4,418,567

KNOCK SENSING APPARATUS WITH FAIL INDICATOR FOR USE IN AN INTERNAL COMBUSTION ENGINE

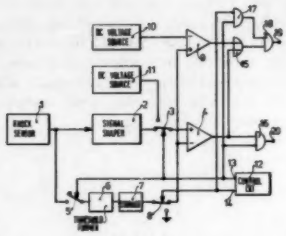
Bernward Böning, Ludwigsburg; Rudolf Nagel, Asperg; Günter Hönig, Ditzingen; Uwe Kiencke, Ludwigsburg, and Heinz Theuerkauf, Braunschweig-Hondelage, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 9, 1980, Ser. No. 195,385

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942250

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 11 Claims



1. Apparatus for furnishing a knock signal indicative of knocking in an internal combustion engine comprising

sensing means (1; 43, 44, 45, 38) for sensing mechanical oscillations in the internal combustion engine and furnishing sensing output signals corresponding thereto, said sensing output signals constituting said knock signal in the presence of engine knocking;

control circuit means (12) for generating

a first gating signal defining a measuring phase (22) during which the sensing output signals are measured for presence of said knock signal, and

a second gating signal defining a test phase (23) during which the sensing output signals are measured to determine proper operation of the sensing means and generating "fail" signals if said measurement determines improper operation of the sensing means,

including

comparator means (4, 9) for comparing, during said test phase, said sensing output signals to

(a) a first reference signal indicative of a predetermined minimum level, and

(b) to a second reference signal indicative of a predetermined maximum level, and

switch means (3, 5) controlled by said gating signals and connecting, during said test phase, the sensing output signals to the comparator means.

4,418,568

HOT FILM FLUID FLOWMETER WITH AUXILIARY FLOW SENSING

James J. Surman, Mt. Clemens, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 10, 1981, Ser. No. 300,790

Int. Cl.³ G01F *5/00, 1/68*

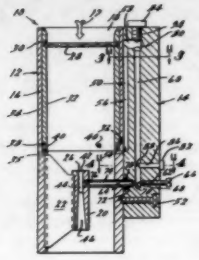
U.S. Cl. 73—202 26 Claims

1. A fluid flowmeter comprising:

means defining a main passage for the flow of a fluid therethrough;

means defining a secondary passage extending substantially parallel to said main passage and including an inlet for receiving a portion of the fluid flowing in said main passage, a throat and an outlet for discharging the portion back into the main passage;

means defining a tertiary passage fluidly interconnecting said throat and a point in said main passage displaced from said throat; and



a constant temperature thermal anemometer operative to monitor the rate of flow of fluid flowing in said tertiary passage and to generate a total flow rate output signal as a function thereof.

4,418,569

DEVICE FOR THE CAPACITIVE MEASUREMENT OF THE FILLING LEVEL OF FLUID TO A CONTAINER

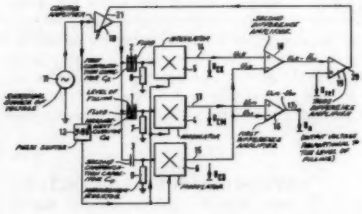
Frank Kühnel, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 6, 1980, Ser. No. 204,392

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2945965

Int. Cl.³ G01F *23/26*

U.S. Cl. 73—304 C 8 Claims



1. In a device for the capacitive measurement of a level of filling of a fluid in a container having a measurement capacitor which extends into the fluid to be measured in accordance with the level of filling thereof, means for forming an electric value corresponding to the level of filling, and means for compensating for different dielectric constants of the fluid which comprise a compensation capacitor positioned in the fluid, the improvement wherein

a circuit comprises said means for forming an electric value corresponding to the level of filling and said means for compensating for different dielectric constants of the fluid such that only the imaginary part of the complex conductance of the measurement capacitor and of the compensation capacitor enters into said electric value exclusive of the real part thereof in each case,

said means for compensating forms a value in accordance with the equation

$$h = \frac{1}{} \frac{C_{KO}(C_M - C_{MO})}{C_{MO}(C_K - C_{KO})}$$

in which:

h is the height of the section of the measurement capacitor extending into the fluid;

l is the total height of the measurement capacitor;

C_K is the capacitance of a first compensation capacitor in the fluid;

C_{KO} is the capacitance of a second compensation capacitor in air;

C_M is the capacitance of the measurement capacitor in the fluid; and

C_{MO} is the capacitance of the measurement capacitor in air;

said circuit includes:

formation means for the formation of output voltage proportional to the respective capacitances of said capacitors,

said formation means comprises a source of sinusoidal voltage for feeding feed voltage to subcircuits, respectively, for each of said capacitors, said subcircuits comprising

a measurement resistor connected in series with one of said capacitors, respectively,

said formation means includes means for producing a phase-shifted sinusoidal voltage which is shifted 90 degrees with respect to the feed voltage,

said subcircuits further comprising, respectively, for each of said capacitors

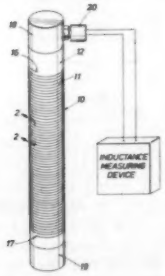
means comprising an alternating voltage multiplier with low pass properties having a cut-off frequency less than twice the frequency of the feed voltage for multiplying the voltage drop on the corresponding said measurement resistor by the phase-shifted sinusoidal voltage and for filtering an alternating-voltage component out of the voltage formed as a product, so that an output voltage proportional to the capacitance of the corresponding one of said capacitors is present at the output of the alternating voltage multiplier with low pass properties.

4,418,570

ICE THICKNESS INDUCTOR PROBE

Hollie B. Warren, Jr., and Thomas A. Paulley, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Dec. 8, 1981, Ser. No. 328,562
Int. Cl.³ G01F *23/00*
U.S. Cl. 73—304 R **10 Claims**



1. An apparatus for determining the thickness of an ice sheet floating on a body of sea water, comprising:

(a) an elongated support constructed from non-magnetic, non-electrically conducting material capable of withstanding subzero (°C.) temperatures without becoming brittle and having a helical groove formed about an outer surface;

(b) a coil of non-corroding, low resistance wire wound in a closely packed helix, whose length is greater than its diameter, in said helical groove;

(c) means for connecting said coil to a source of alternating current; and

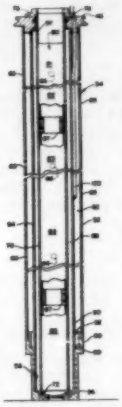
(d) means for measuring an inductance value of said coil and relating said inductance value to the thickness of said ice sheet.

4,418,571

LIQUID LEVEL MEASURING SYSTEM

Einar Asmundsson, Middle Haddam; Robert P. Hart, Glastonbury, and Donald W. Fleischer, Wethersfield, all of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Division of Ser. No. 181,083, Aug. 22, 1980. This application Dec. 18, 1981, Ser. No. 331,993
Int. Cl.³ G01F *23/26*
U.S. Cl. 73—304 C **6 Claims**



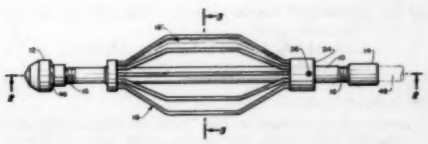
1. In a liquid level measurement device having an elongated capacitance probe with a succession of a plurality of longitudinally extending capacitor sections, each having a separately measurable capacitance value which varies between dry minimum and submerged maximum values thereof, the improvement wherein the capacitance probe comprises an outer capacitance tube, an imperforate glass tube mounted generally coaxially within the outer capacitance tube to define a capacitor annulus therebetween, and an inner capacitor sleeve mounted coaxially within the glass tube and having a succession of a plurality of separate, longitudinally extending capacitance sleeve sections cooperating with the outer capacitance tube to form said plurality of capacitor sections respectively.

4,418,572

SEWER PIPE TESTER

Charles J. Prange, Cridersville, Ohio, assignor to Sewer Rodding Equipment Co., Lima, Ohio

Filed May 1, 1981, Ser. No. 259,370
Int. Cl.³ G01B *21/00*
U.S. Cl. 73—432 R **13 Claims**



1. A sewer pipe proofer comprising:

a section of conduit having an outer diameter substantially smaller than the inner diameter of the sewer pipe being proofed;

a fluid spraying nozzle attached to one end of said conduit;

a plurality of deformable spacers in the form of rods secured

around said conduit intermediate said ends, said rods being formed to hold said conduit substantially centered and in spaced relationship to the inner wall of said sewer pipe;

means removably securing said rods to said conduit with at least one end being free to be slidably displaced in a direction parallel to the axis of said conduit when the rods are deformed;

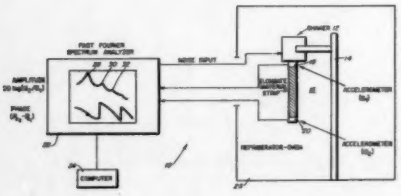
restraining means restraining said at least one free end of said rods;

said means removably securing said rods to said conduit being removable to allow easy removal and replacement of individual rods whereby said conduit can be passed through a sewer pipe to test for blockage and easily pass over minor irregularities.

4,418,573
METHOD FOR MEASURING MATERIAL CHARACTERISTICS

Walter M. Madigosky, and Gilbert F. Lee, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1982, Ser. No. 392,813
Int. Cl.³ G01H *15/00*
U.S. Cl. 73—574 **1 Claim**



1. A method of measuring acoustic properties of a material comprising:

selecting an elongate sample of the material having a length considerably greater than its lateral dimensions;

securing accelerometers at opposite ends of the elongate sample for measuring longitudinal displacements thereof;

driving one end of the elongate sample with random noise while allowing the other end to move freely for establishing resonant standing waves longitudinally thereof between its ends;

measuring the amplitude and phase difference of acceleration ratio near resonant peaks for the elongate sample when the ends are approximately 90° out of phase with each other which provides values for Q, wherein $Q=20 \log (a_2/a_1)$, and frequency (f) for each resonant peak;

applying the values of Q to the formula

$$\sin h(\xi \tan \theta/2)(\sin \xi + R\xi \cos \xi) + R\xi \tan \theta/2 \sin \xi \cos h(\xi \tan \theta/2) = 1/Q$$

and solving it simultaneously with the formula

$$\cos h(\xi \tan \theta/2)(\cos \xi - R\xi \sin \xi) + R\xi \tan \theta/2 \cos \xi \sin h(\xi \tan \theta/2) = 0$$

for ξ and $\tan \theta/2$,

wherein ξ is related to the speed of sound propagating through the sample, θ is the phase lag between stress and strain, and R is the mass ratio;

calculating the speed of sound (c) propagating through the material according to the formula

$$c = 2\pi f L/\xi$$

wherein L is the length of the elongate sample of material;

calculating Young's modulus (E') for the material from the formula

$$E' = \rho c^2 \cos^2 (\theta/2) \cos \theta,$$

wherein ρ is the mass density of the material; and

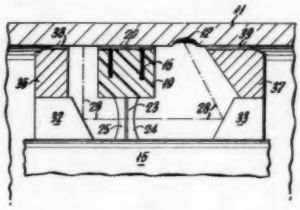
calculating the loss factor (δ) of the material from the formula

$$\delta = \tan \theta.$$

4,418,574
MAGNETIC METHOD AND APPARATUS FOR MEASURING WALL THICKNESS

Norman E. Flournoy, Houston, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,600
Int. Cl.³ G01N *29/04, 27/82*
U.S. Cl. 73—601 **5 Claims**



2. A combined magnetic and acoustic wall thickness and condition measuring apparatus, comprising in combination

pulsed magnetic reluctance means for measuring said wall thickness, and

ultrasonic means for measuring the distance of said magnetic means from said wall and for determining the presence of an anomaly in said wall,

said ultrasonic means comprising a transducer mounted in a fixed position relative to said magnetic means, and

means for directing ultrasonic energy both perpendicular to said wall and at an angle of incidence greater than the critical angle of refraction of said wall.

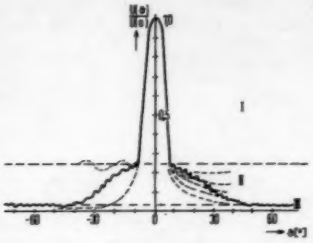
4,418,575
METHOD FOR PROCESSING ULTRASONIC ECHO SIGNALS OF BOTH DIRECTIONALLY REFLECTING AS WELL AS NONDIRECTIONALLY SCATTERING OBJECTS, PARTICULARLY FOR ULTRASONIC IMAGE PROCESSING IN THE FIELD OF SUBSTANCE OR TISSUE INVESTIGATION

Eckart Hundt, Haar, and Elmar Trautenberg, Fuerth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 15, 1981, Ser. No. 264,131
Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019435
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—607 **31 Claims**

1. A method for processing ultrasonic echo signals of both directionally reflecting and nondirectionally scattering objects, particularly for ultrasonic image processing in the field of substance and tissue examination, said method comprising: scanning an object from various scanning directions to produce respective ultrasonic echo signals from respective common object areas, and linking the ultrasonic echo signals from various scanning directions as to respective common object areas in dependence upon the presence of echo signal ampli-

'udes corresponding to directional reflection from the object for producing an image in such manner that the derivation of



the echoes from directionally reflecting or nondirectionally scattering object areas is taken into consideration.

4,418,576

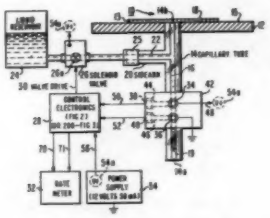
APPARATUS AND METHOD FOR AUTOMATICALLY REPLENISHING LIQUID AND MEASURING THE RATE OF EVAPORATION OF A LIQUID

Allan E. White, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 279,739, Jul. 2, 1981. This application Jun. 21, 1983, Ser. No. 505,125

Int. Cl.³ G01N *33/18, 25/00*

U.S. Cl. 73—61.3 **13 Claims**



1. In an apparatus for automatically measuring the rate of evaporation of a liquid of the type having a capillary tube with a passageway having two open ends, said tube joined at one end to a plane having two parallel extensive surfaces such that the one end portion of the tube extends vertically upwardly through one of the plane surfaces and terminates at the other plane surface, the other open end of the tube being exposed to the ambient; an evaporation surface comprising a sheet of liquid saturable fibrous material attached to the other surface and extending sufficiently over the plane surface to cover the surface and the capillary tube end; whereby liquid saturating the sheet and extending through the passageway of the capillary tube will be drawn upwardly from the tube into the sheet as liquid evaporates from the sheet into the ambient air, the rate of upward movement of liquid in the tube passageway being an indicia of the evaporation rate of the liquid from the sheet, the improvement comprising:

reservoir means for providing said liquid to said tube;

means for replenishing said liquid automatically as it evaporates from said sheet; and

means for determining the rate of evaporation of the liquid by sensing the movement of the liquid drawn upwardly through a predetermined portion of the tube as the liquid evaporates from the sheet;

said replenishing means including means for maintaining continuous capillary action comprising a reservoir supply line for carrying said liquid to said capillary tube at a location in said tube above said predetermined portion to assure continuous capillary action in said tube.

4,418,577

PROCESS FOR MEASURING AND ANALYZING POTENTIALS OF PIEZO-ELECTRIC ORIGIN GENERATED BY A RIGID MEMBER MADE OF AN ORGANIC MATERIAL

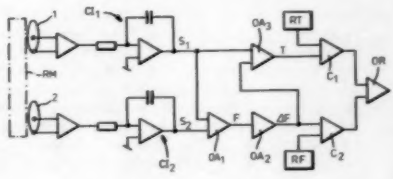
Simon Arieh; Guy Courvoisier, and Jean-Louis Prost, all of Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Continuation of Ser. No. 198,005, Nov. 3, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,667

Claims priority, application Switzerland, Feb. 5, 1979, 1085/79

Int. Cl.³ G01B *7/16*

U.S. Cl. 73—772 **12 Claims**



1. A process for measuring and analyzing potentials of piezoelectric origin generated by a long rigid member made of an organic material as the result of a mechanical strain on this member, characterized by the fact that the signals which are characteristic of the potentials are detected at two longitudinally spaced points at least adjacent to the surface of this member, in that each of these signals is amplified and integrated, that the types of stresses generating the said signals are identified and that these stresses are measured separately.

10. An apparatus for determining stresses in an elongated rigid member of organic material resulting from mechanical action upon said member which is substantially fixed at one end, and responds as a beam fixed at one end, said apparatus comprising:

means for detecting piezoelectic potentials at two points along said member spaced apart by a predetermined distance and spaced from said end and forming said potentials into respective signals;

means for applying and integrating the signals generated at each of said points;

means for determining a difference between the values of the amplified and integrated signals;

means for multiplying said difference by the ratio of the distance between said end and the said point most distal therefrom and the distance between said points to obtain a value of flexion stress; and

means for detecting the difference between the greater of said signals and said value of said flexion stress to obtain a valve of torsional stress.

4,418,578

LOW NOISE VORTEX SHEDDING FLUID FLOW SENSOR

Chester J. Blechinger, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 26, 1982, Ser. No. 401,447

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.22 **6 Claims**

1. An apparatus for measuring the velocity of fluid including:

a wall means for bounding a stream of fluid flow;

a vortex generating means positioned inside said wall means

in the stream of fluid flow for generating a stream of vortices in the wake of said vortex generating means;

wall rib means extending from said wall means into the stream of fluid flow and extending longitudinally in the direction of the stream of fluid flow for reducing turbulence in the stream of fluid flow, said wall rib means having alternating troughs and ridges in a direction transverse to fluid flow; and

said vortex generating means being elongated in a direction transverse to the direction of fluid flow and including generator rib means adjacent the stream of fluid flow and extending generally transverse to the direction of elongation of said vortex generating means so that said generator rib means extend generally longitudinally in the direction of the stream of fluid flow for reducing noise and turbulence in the stream of fluid flow, said generator rib means having alternating troughs and ridges in a direction transverse to fluid flow.

4,418,579

FLUID FLOW MONITORS

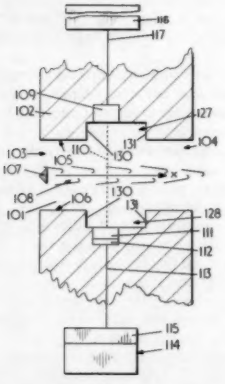
Peter F. Harrington, Ashby-de-la-Zouch, United Kingdom, assignor to Coal Industry (Patents) Limited, London, England

Filed Dec. 12, 1980, Ser. No. 215,906

Claims priority, application United Kingdom, Dec. 21, 1979, 79/44212; Jun. 13, 1980, 80/19351; Jan. 18, 1980, 80/01698

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.23 **14 Claims**



1. A fluid flow monitor comprising a head portion defining a passage for fluid flow to be monitored, a vortex inducing element arranged at least part way across the passage, sensing means for sensing the vortices induced by the element and for deriving a signal indicative of the sensed vortices, and at least one formation associated with a side wall of the passage and tending to interfere with fluid flow along the passage, the formation being provided on the downstream side of the vortex inducing element, in which the formation is provided by having the sensing means associated with a recessed part of the passage wall.

4,418,580

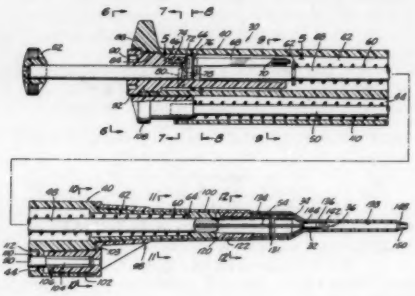
PIPETTOR MECHANISM AND DISPOSABLE TIP AND PISTON ASSEMBLY

Fred E. Satchell, Chesterfield; William D. Cornell, Ballwin, both of Mo.; Mark O. Uitz, Mountain View, Calif., and Clarence L. Walker, Webster Groves, Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Oct. 13, 1981, Ser. No. 310,489

Int. Cl.³ B01L *3/02*

U.S. Cl. 73—864.13 **18 Claims**



11. A pipettor for use with a disposable tip and piston assembly, comprising: a housing; a plunger movable in the housing; and an ejector mechanism; said plunger having a forward end adapted to detachably engage the piston of a disposable tip and piston assembly and being sized to move freely in said assembly when the piston is detachably engaged thereby; said ejector including means for substantially simultaneously ejecting a disposable tip and a piston therewithin from the pipettor, including means for removing a piston from the forward end of the plunger.

4,418,581

APPARATUS AND METHOD FOR SAMPLING A LIQUID

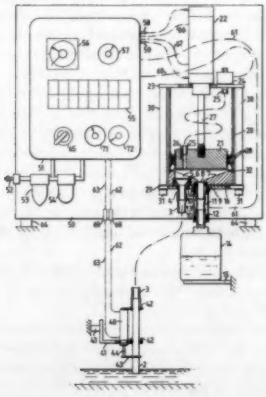
Richard W. Jones, 4 Upland Park Rd., Oxford, England OX2 7RW

Filed May 12, 1981, Ser. No. 262,904

Claims priority, application United Kingdom, May 13, 1980, 8015727

Int. Cl.³ G01N *1/14*

U.S. Cl. 73—864.34 **9 Claims**



1. A sampler for a substantially liquid material comprising:

(a) a working chamber;

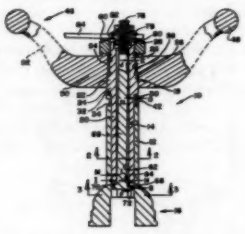
(b) a vent valve for supplying compressed air to the working chamber;
(c) a bulk material inlet to the working chamber;
(d) a primary piston and cylinder combination whereby the pressure in the working chamber can be varied over a range from sub- to super-atmospheric;
(e) a drive means for reciprocating the primary piston;
(f) a catch tank;
(g) a lip for the catch tank disposed so that when material for sampling rises in the working chamber above the lip level, material flows into the tank and thereafter when the material level falls below lip level, a given volume of material is retained in the tank;
(h) a sample outlet from the catch tank;
(i) a sample valve to control the flow of material along the sample outlet; and
(j) a controller for regulating operation of the vent valve, the drive means and the sample valve.

4,418,582

NO-LASH TELESCOPING STEERING SHAFT

Michael D. Martin, Jeffersonville, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 4, 1981, Ser. No. 270,448
Int. Cl.³ B62D *1/18*
U.S. Cl. 74—493 **10 Claims**



1. An axially elongatable shaft comprising first and second elongate parts, one of which is axially movable with respect to the other of said parts, said first part being polygonal or noncircular in transverse cross section, and said second part having a substantially corresponding polygonal or noncircular bore therein for receiving said first part, and axially movable means extending from one end of said first part to an opposite end of said first part, said axially movable means being operatively engageable with said first and second parts for causing a moment therebetween substantially about said first part one end in a first axial plane upon axial movement of said means to thereby resist side-to-side and axial relative movement of said first and second parts in said first axial plane, said moment also urging said axially movable means into engagement with said first part substantially at said opposite end to resist side-to-side movement therebetween.

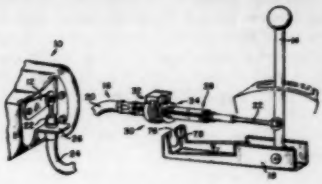
4,418,583

LOCKING DEVICE

Alistair G. Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 6, 1981, Ser. No. 280,751
Int. Cl.³ F16C *1/10*
U.S. Cl. 74—501.5 R **7 Claims**

7. A locking device for attachment to an elongate member said locking device comprising at least a first part and a second part, each of said parts defining an opening through which said elongate member extends, each of said parts being movable axially on said elongate member in a first mode of attachment with said elongate member, one of said parts being rotatable relative to said elongate member and said other part to define a second mode of attachment for said parts with said elongate member wherein said first and said second parts are releasably locked to said elongate member to prevent axial movement of said first and second parts relative to said elongate member said



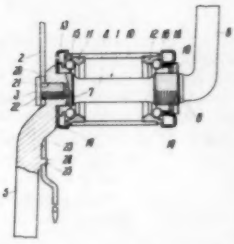
elongate member including a substantially triangular cross section with the edges of the triangular cross section defining gripping surfaces at the edges and the triangular cross section forming sliding surfaces between the edges.

4,418,584

GEAR CRANK FOR A BICYCLE

Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed May 26, 1981, Ser. No. 266,649
Claims priority, application Japan, Jun. 11, 1980, 55-81888[U]
Int. Cl.³ G05G *1/14*
U.S. Cl. 74—594.2 **3 Claims**



1. A gear crank for a bicycle, comprising: a one-piece crank having a crank shaft and a pair of integral crank arms; a chain gear; and a screw member for fixing said chain gear to said crank, said crank having at the axially outer surface of said crank shaft at the one axial end side thereof a receiving face comprising a vertical face to receive thereat said chain gear, said receiving face having a threaded portion extending axially of said crank shaft, said chain gear having a first through bore for said screw member and a second through bore for one of said crank arms and being seated at said receiving face, said screw member screwing with said threaded portion to thereby detachably fix said chain gear to said crank.

4,418,585

FOUR SPEED RATIO TRANSVERSE AUTOMATIC TRANSMISSION

Stanley L. Pierce, Walled Lake, Mich., assignor to Ford Motor Company, Dearborn, Mich.

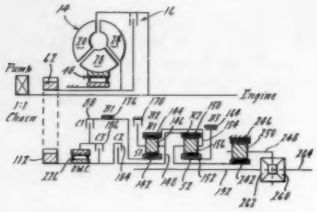
Filed Apr. 21, 1980, Ser. No. 141,855
Int. Cl.³ F16H *37/08*
U.S. Cl. 74—695 **3 Claims**

1. In a power transmission mechanism for an automotive vehicle having an engine and traction wheels, a hydrokinetic unit having an impeller and a turbine mounted on a first axis, said impeller being connected to said engine;
planetary gearing mounted on a second axis that is spaced laterally from said first axis, a torque input shaft for said gearing;

torque transfer means drivably connecting said turbine and said input shaft;

said gearing comprising a pair of simple planetary gear units, each gear unit having a sun gear, a ring gear, a carrier and planet pinions on said carrier engaging said sun and ring gears, a first friction clutch means and an overrunning coupling in series relationship adapted to connect said input shaft to the sun gear of a first of said gear units, a torque output shaft connected to the carrier of the second of said gear units, a pair of drive shafts for the traction wheels, one drive shaft extending through said gearing and the other extending in the opposite direction, final drive gearing including a differential gear assembly having a torque input element and connecting said torque output shaft with said drive shafts, the ring gear of said first gear unit being connected to the carrier of said second gear unit;

first brake means for braking the sun gear of said first gear unit during overdrive operation;



second brake means for braking the carrier of said first gear unit during reverse drive, the ring gear of said second gear unit being connected to the carrier of said first gear unit;

third brake means for braking the sun gear of said second gear unit during first and second underdrive operation;

second friction clutch means for connecting said input shaft to the carrier of said first gear unit during third direct drive operation and during overdrive operation;

and third friction clutch means in parallel with said overrunning coupling;

said torque transfer means comprising a first sprocket connected to the turbine of said hydrokinetic unit, a second sprocket connected to said input shaft and a drive chain drivably connecting said sprockets, said differential gear assembly, said gear units and said second sprocket being mounted about said second axis, said axes being parallel to each other and being adapted to be mounted transversely with respect to the fore-and-aft centerplane of the vehicle.

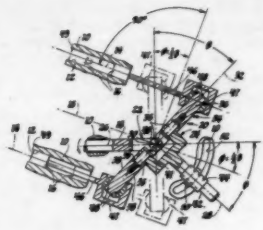
4,418,586

SWASH PLATE DRIVE MECHANISM

E. Roland Maki, Rochester, Mich., and Ferdinand Freudenstein, Riverdale, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed May 20, 1981, Ser. No. 265,653
Int. Cl.³ F16H *23/00, 35/08*
U.S. Cl. 74—831 **4 Claims**

1. A swash plate drive mechanism comprising a pair of rotary shafts with intersecting axes, and an articulated swash plate connected as a floating link between said shafts for pivotal movement about crossed-axes such that said shafts are caused to rotate conjointly while said articulated swash plate is



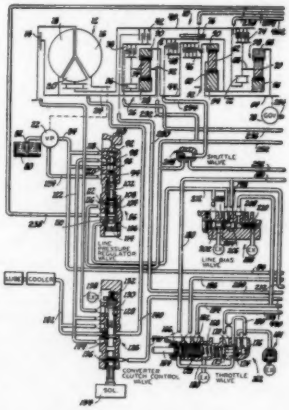
caused to oscillate twice each revolution of said shafts to hereby effect double-frequency swash plate drive motion.

4,418,587

HYDRAULIC SYSTEM PRESSURE CONTROL FOR A POWER TRANSMISSION

Allen L. Kauffman, Dexter, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1980, Ser. No. 200,957
Int. Cl.³ B06K *41/04, 41/06*
U.S. Cl. 74—867 **2 Claims**



1. A vehicle transmission and control for a throttle controlled engine driven vehicle comprising; a plurality of fluid pressure operated friction devices for establishing torque transmission paths in the transmission; pump means for supplying pressurized fluid to operate the friction devices; throttle valve means in fluid communication with said pump means and responsive to an engine control which establishes engine torque levels for providing a regulated throttle pressure which increases with increased engine torque levels; system pressure regulator valve means for establishing a system pressure for the fluid from the pump to thereby control the torque capacity of the friction devices including resilient bias means for establishing a minimum system pressure and a pressure bias chamber which is effective to produce a change in the system pressure above the minimum pressure in substantial proportion to the pressure in the pressure bias chamber; and pressure bias valve means in fluid communication between said throttle valve means and said pressure bias chamber for directing a bias pressure to said pressure bias chamber which bias pressure is substantially equal to the throttle pressure when the throttle

pressure is less than a predetermined level and increases in substantial proportion to but less than the throttle pressure when the throttle pressure is above the predetermined level.

4,418,588

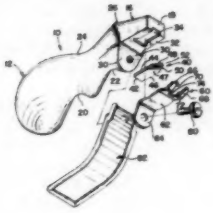
SHARPENING DEVICE FOR SINGLE EDGE TYPE CUTTING BLADES

John E. Byers, P.O. Box 556, Whitefish, Mont. 59937

Filed Mar. 1, 1982, Ser. No. 353,051

Int. Cl.³ B21K *11/00*

U.S. Cl. 76—88 **7 Claims**



1. A sharpening device for tools and instruments having single cutting edge type blades such as lawnmowers and the like, comprising:

(a) a body having a front end and a rear end and including a hand grip section at said rear end over a substantial portion of said body, said body further including a blade mounting nose portion extending outwardly from said hand grip section and having an outer end which forms the front end of said body,

(b) said blade mounting nose portion having a generally planar mounting surface extending from said outer end to said hand grip section such that a generally rearwardly angling offset surface is defined on said body, said mounting surface extending generally longitudinally forwardly from said offset surface;

(c) blade cavity means located in said mounting surface and being generally rectangularly shaped and extending from near said offset surface forwardly and opening on said front end for receiving sharpening blade means therein,

(d) blade means detachably inserted in said cavity means, said blade means being of predetermined thickness and having a back end and sides configured to be received into said cavity means and having a sharpening end which extends forwardly and outwardly of said front end, said sharpening end being V-shaped to define two sharpening edges, and

(e) blade guide and retainer means detachably secured to said offset surface and shaped to extend over substantially all of said blade mounting surface for holding said blade means securely in place, said blade guide and retainer means having a guide portion extending forwardly and outwardly of said front end and including a generally U-shaped opening such that a pair of spaced apart guide surfaces are formed so that the sharpening device may be used to sharpen the cutting edge of a tool blade which passes between a sharpening edge and one of said guide surfaces.

4,418,589

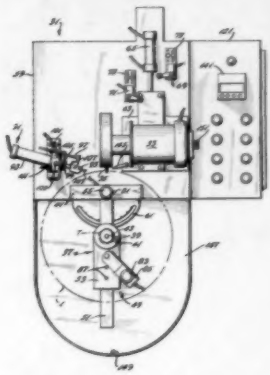
METHOD AND APPARATUS FOR AUTOMATICALLY FACING SAW BLADES HAVING VARYING CONFIGURATIONS OF TEETH

Ronald G. Cowart, Sr., Rte. 2, Box 28, Hahira, Ga. 31632

Filed Feb. 26, 1981, Ser. No. 238,366

Int. Cl.³ B23D *63/12*

U.S. Cl. 76—112 **25 Claims**



22. A method for grinding saw blades of the rotary type, the method comprising the steps of:

(a) placing the saw blade on a center spindle;

(b) indexing the saw blade by extending an indexing means against a saw tooth to an index position;

(c) retracting the index means;

(d) gripping the saw blade by electromagnetic force after the saw blade has been indexed, said electromagnetic force being reduced before said indexing step and being increased after said indexing step;

(e) reciprocating a grinding wheel toward the index position, thereby allowing the grinding wheel to face grind the saw blade;

(f) retracting the grinding wheel away from the index position;

(g) repeating steps b–f a predetermined number of times.

4,418,590

SCREW ASSEMBLY WITH TORQUE DETERMINATION

Oswald Dubiel, Neunkirchen-S.; Karl R. Hirtsiefer, Neunkirchen, both of Fed. Rep. of Germany; Johann Müller, deceased, late of Much, Fed. Rep. of Germany, and by Christine Müller, executrix, Much-Nehhoven, Fed. Rep. of Germany, assignors to Paul-Heinz Wagner, Much-Birrenbachschöbe, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,455

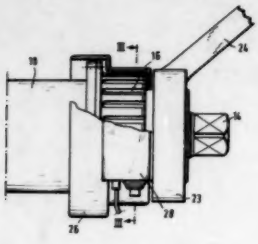
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023005

Int. Cl.³ B25B *23/14*

U.S. Cl. 81—467 **19 Claims**

1. Apparatus comprising a drive unit for imparting torque to a output shaft, a casing housing said drive unit and being subject to such torque, an opening in said casing exposing said output shaft for connection to a driven member, a torsionally elastic tube member surrounding said casing and having axially opposite end portions, means for securing a first end portion of said tube member to said casing, means for preventing rotation of a second end portion and said tube member upon the operation of said drive unit whereby casing torque is transmitted to said first end portion while said second end portion is prevented from rotating, a switch element carried by said tube member at a portion thereof between said first and second end portions whereby torque transmitted to said first end portion is

reflected by switch element movement, switch means for responding to switch element movement, and a switch arm for



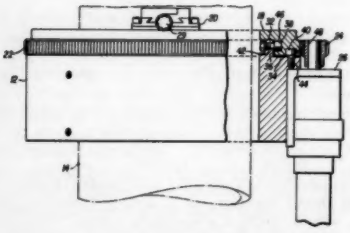
transmitting motion of said switch element to said switch means.

4,418,591

PIPE END PREPARATION AND CUTOFF TOOL

William H. Astle, Rancho Cordova, Calif., assignor to Tri Tool Inc., Rancho Cordova, Calif.

Filed Aug. 24, 1981, Ser. No. 295,368
Int. Cl.³ B23B *5/14*
U.S. Cl. 82—4 C **7 Claims**



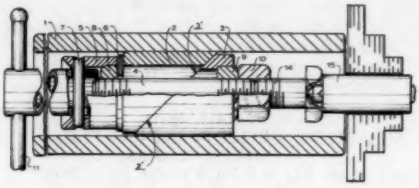
1. In a pipe end preparation tool having a tool axis, including a generally annular pipe-engaging support housing member extending along the tool axis, and a tool carrier ring member mounted on the end of the housing member for rotation relative thereto about the tool axis, the improvement comprising, said ring member connected to said housing member by a roller bearing assembly comprising two sets of rollers mounted on one of the members and respectively mounted for rotation about axes located in orthogonal planes, each set of rollers being circumferentially spaced about the ring and housing members, said rollers having peripheral bearing surfaces engaging and cooperating with circumferential bearing races provided on the other member, said races lying generally in the same respective orthogonal planes as said bearing rollers, said bearing surfaces arranged to lie within said bearing races, said bearing races comprising grooves with sidewalls extending parallel with and engageable by said bearing surfaces, whereby radial and thrust loading applied to the ring member can be reacted by the housing member through the bearing surfaces and bearing races.

4,418,592

STOPPING FIXTURE

Vladimir Altman, 2985 Ocean Pkwy., #3-D, Brooklyn, N.Y. 11235

Filed Apr. 6, 1981, Ser. No. 159,061
Int. Cl.³ B23B *3/36*
U.S. Cl. 82—34 C **11 Claims**



1. A stopping fixture for a hollow headstock spindle having an axis, comprising

a first element arranged to be inserted into a hollow of a headstock spindle and to move in an axial direction of the latter, said first element having a first surface which is inclined relative to an axis of the headstock spindle;

a second element also arranged to be inserted into the hollow of the headstock spindle and to move in the axial direction of the latter, said second element having a second surface inclined relative to the axis of the headstock spindle and cooperating with said first inclined surface of said first element so that when one of said elements is moved axially relative to the other of said elements, said elements move radially apart from one another and are pressed against an inner wall of the headstock spindle to be fixed in the latter at a predetermined location; and

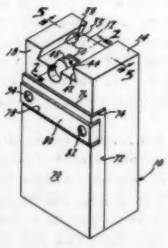
means for moving said one element relative to said other element so as to provide for cooperation of said inclined surfaces of said elements, said moving means including a threaded member connected with said other element so that when said threaded member is moved axially it moves axially said other element relative to said one element, said elements being tubular and having outer cylindrical surfaces of substantially equal diameters and inner cylindrical surfaces of diameters considerably exceeding the diameter of said threaded member.

4,418,593

FORM TOOL HOLDER

Edmund W. Frydel, Marine City, Mich., assignor to Fox Mfg. Co., Mt. Clemens, Mich.

Filed Sep. 17, 1981, Ser. No. 303,073
Int. Cl.³ B23B *29/00*
U.S. Cl. 82—36 R **6 Claims**



1. A form tool holder comprising

a body having a dovetail slot in one end thereof for accepting and snugly but slidably fitting the dovetail portion of a conventional form tool cutter;

mounting means on a side of the body at one end of said dovetail slot for detachably fastening said body to the tool support member of a machine tool; and

means for holding the cutter securely in said dovetail slot comprising cooperative independently adjustable clamping and back-up means, said clamping means carried by said body at one side of said dovetail slot and being longitudinally movable transversely of the latter, said clamping means having a portion thereof in said dovetail slot complementing and engageable with the dovetail portion of said cutter at one side of said dovetail portion

said back-up means comprising a way in and extending longitudinally of said dovetail slot and a back-up block mounted in and movable longitudinally along said way, said back-up block having a lateral abutment portion extending from said way into said dovetail slot through the bottom thereof for endwise engagement with the dovetail portion of said cutter to position the latter lengthwise in said slot when the cutter is released by said clamping means and being operative in use to position said cutter with one end portion thereof extending from said slot for proper engagement with a workpiece,

said clamping means further including an actuator disposed at and operable from the end of said body opposite said dovetail slot, and

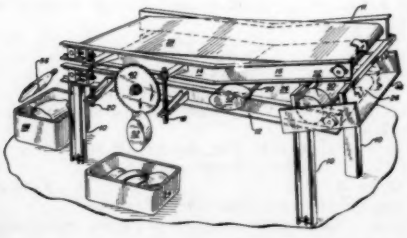
said back-up means further including an actuator disposed at and operable from the side of said body opposite said mounting means for adjusting said back-up means in said way and longitudinally of said dovetail slot, said clamping means and said back-up means being mutually cooperative to hold the cutter in a selected longitudinally adjusted position in said dovetail slot.

4,418,594

BOTTLE SAW SYSTEM

Charles W. Burns, Jr., Orlando, Fla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 13, 1981, Ser. No. 320,867
Int. Cl.³ B26D 7/08
U.S. Cl. 83—19 **6 Claims**



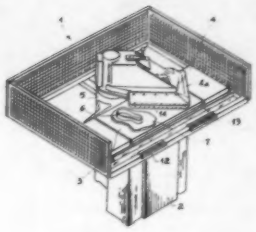
6. A method of cutting a plastic bottle into upper and lower portions measured axially of the bottle which comprises guiding the bottle into a compression zone, compressing the bottle, passing the bottle past a saw, and separately recovering upper and lower portions of the bottle.

4,418,595

AUTOMATIC HOLLOW PUNCH SEARCH METHOD FOR DIE-CUTTING MACHINES, PARTICULARLY FOR FOOTWEAR PRODUCTION

Emiliano Cantella, Vigevano, Italy, assignor to Atom S.p.A., Vigevano, Italy

Division of Ser. No. 140,087, Apr. 14, 1980, Pat. No. 4,363,253.
This application Jun. 2, 1982, Ser. No. 384,330
Claims priority, application Italy, Apr. 27, 1979, 22220 A/79
Int. Cl.³ B26D 3/00
U.S. Cl. 83—55 **5 Claims**



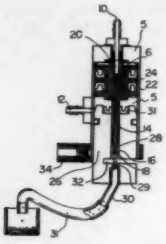
1. A method of operating a die-cutting machine particularly for cutting material for footwear, said machine being of the type which has a fixed faceplate on which the material to be cut is placed and a mobile head mounted for motion in a horizontal plane above substantially the entire surface area of said faceplate, said machine further being of the type that uses separate hollow punches of different sizes and shapes positioned by the operator on the material to be cut on said faceplate, the method which comprises the steps of moving said mobile head in said horizontal plane starting from a rest position to seek a hollow punch therebelow, sensing a hollow punch on said material with means on said head as said head is moved in said horizontal plane, moving said head in a continuous and automatic cycle of operation starting from said rest position, moving said head in said horizontal plane until said sensitive element senses a hollow punch, stopping the motion of said head in said horizontal plane after said sensitive element has sensed that it has passed over said hollow punch and that said mobile head is therefore positioned over said sensed hollow punch, moving said head down to said hollow punch and then back up to said horizontal plane in a vertical cutting stroke, and then returning said head to said rest position, said machine comprising electrical circuit means and providing a pair of condensers in said electrical circuit means, causing said sensitive element to generate a signal starting from the time it first senses a hollow punch positioned on said material to be cut until the time it passes over said sensed hollow punch, providing a relatively large capacity in one of said condensers and providing a relatively small capacity in the other of said condensers, positioning both of said condensers in parallel circuits within said circuit means, and arranging said condensers within said circuit means such that either one of said condensers, upon its discharging, will operate other means to cause said head to cease its motion in said horizontal plane and to commence its motion in said vertical cutting stroke, and the step of selectively adjusting the capacity of said condenser of relatively smaller capacity, whereby said large capacity capacitor will not discharge until said head has completely passed over punches of normal to larger than normal size, and whereby said adjusted capacity of said capacitor of relatively smaller capacity will cause stoppage of motion in the horizontal plane and initiation of a vertical cutting stroke when said sensitive element senses a punch of relatively small size.

4,418,596

PHOTOGRAPHIC PAPER PUNCH

Jose M. Garrocho, 7572 Rockhill Rd., Mississauga, Ontario, Canada L4T 2Z7

Filed Apr. 2, 1981, Ser. No. 250,260
Int. Cl.³ B26F *1/14*
U.S. Cl. 83—98 **3 Claims**



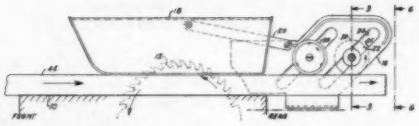
1. A pneumatic punch for paper comprising:
(a) a cylinder having a chamber;
(b) a piston seated within the cylinder chamber, to be pneumatically driven between upper and lower limits within the chamber;
(c) actuation and retraction air inlet ports through the wall of the cylinder to provide the pneumatic drive of the piston, the ports being separated by the piston against fluid communication within the cylinder chamber between the ports:
(d) an elongated guide of constant, circular cross-section secured centrally to the piston on the side thereof exposed to the air from the retraction air inlet port;
(e) an elongated punch of circular cross-section concentrically secured to the free end of the guide;
(f) a central relatively restricted air passageway from the actuation air inlet side of the piston, extending through the piston, guide and punch;
(g) a die cooperating with the punch, having a body rigidly associated with the cylinder and centrally receiving the guide, and having a slot of circular cross-section to receive the punch;
(h) a space being provided between the punch, when the piston is at its upper limit, and the entrance to the slot of the die to receive and permit passage of paper to be punched;
whereby, during an operation cycle, air pressure introduced through the actuation air inlet port drives the piston to its lower limit and air is passed through the central air passageway of the piston, guide and punch to force a slug of punched paper on through the slot, that air pressure is then removed, and air pressure is introduced through the retraction air inlet port to force the piston to its upper limit, said punch having associated therewith an air valve, the air valve having a chamber which communicates through valve means with a pressure inlet port, the actuation air inlet port also communicating through another valve means with the pressure inlet port, these two valve means cooperating with each other to enable flow of air pressure to either valve chamber or punch cylinder chamber through the actuation air inlet port while sealing off flow of air pressure to the other; the air valve chamber communicating through further valve means with a pressure exhaust port, a further pressure exhaust port being provided in the punch cylinder chamber on the same side of the piston as the actuation air inlet, this punch cylinder chamber pressure exhaust port communicating through valve means with the air valve chamber pressure exhaust port, these latter mentioned valve means cooperating to enable exhaust of air pressure from either the air valve chamber or the punch cylinder chamber while sealing off the exhaust of air pressure from the other, the operation of these valve means being coordinated with that of the first two mentioned valve means to ensure sealing of the relevant exhaust ports when air pressure is flowing to the respective chambers, the retraction air inlet port of the punch cylinder chamber communicating directly with the air valve chamber, whereby pressurizing of the air valve chamber pressurizes the punch cylinder chamber on the retraction air inlet port side of the piston, and exhausting the pressure from the air valve chamber exhausts the pressure from the punch cylinder chamber on the retraction air inlet port side of the piston.

4,418,597

ANTI-KICKBACK DEVICE

Kenneth J. Krusemark, Hutchinson, Kans., and James L. Stackhouse, Jr., Florissant, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 18, 1982, Ser. No. 340,103
Int. Cl.³ B26D *7/22*; B23D *7/27*; B27G *19/00, 21/00*
U.S. Cl. 83—478 **14 Claims**



1. An anti-kickback device for arresting the reverse movement of a workpiece being moved in one direction on a horizontal table comprising; a support member extending upward above said table and fixed against vertical movement relative to said table, an elongated slot in said member extending longitudinally upward from said table, said slot having a surface defined along one longitudinal side of said slot and said surface being formed as a rack, a wheel lying alongside said member and having a coaxial pinion gear of smaller diameter fixed to one side thereof and entered into said slot, said pinion gear being sufficiently smaller in diameter than the width of said slot to permit the horizontal movement thereof into and out of engagement with said rack, means loosely retaining said pinion gear in said slot thereby permitting said wheel to gravitate and rest on the upper surface of said workpiece and to be moved horizontally by said workpiece in a direction to disengage and maintain disengagement of said pinion gear from said rack and to be rotated in one direction when said workpiece is moving in said one direction, and to be moved horizontally in an opposite direction to engage and maintain engagement of said pinion gear in said rack and to be rotated in an opposite direction to cause said pinion gear fixed thereto to be rotated in a direction in said rack to apply a downward force through said wheel to said workpiece when said workpiece moves in an opposite direction.

4,418,598

ELECTRONIC PERCUSSION SYNTHESIZER

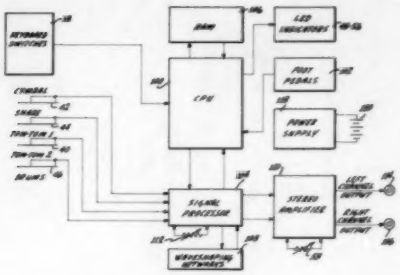
Scott S. Klynas, Simi Valley, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 30, 1981, Ser. No. 335,985
Int. Cl.³ G10H *1/40, 3/12*
U.S. Cl. 84—1.03 **11 Claims**

9. An electronic music synthesizer comprising:
first input means for producing a first signal representing musical tones;
second input means for providing at least two tempo pulses spaced-apart in time where the pulses represent a desired tempo;
timing means responsive to the second input means for determining the frequency of occurrence of at least two successive tempo pulses;

indicator means for indicating a particular pair of successive tempo pulses;

storage means responsive to the timing means for storing the determined frequency of occurrence of successive tempo pulses;



tempo signal generating means responsive to the storage means for generating a continuous tempo signal having a frequency equal to the stored frequency; and

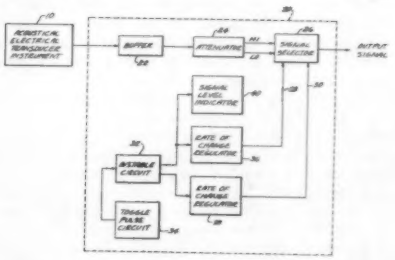
sound signal generating means responsive to the first input means and the tempo signal generating means for generating a sound signal from the first signal and the tempo signal.

4,418,599

ELECTRONIC SIGNAL LEVEL CONTROL APPARATUS FOR ACOUSTICAL-ELECTRICAL TRANSDUCER INSTRUMENT

Gregory D. Raskin, 4311 Ave. G #B, Austin, Tex. 78751

Filed Apr. 8, 1982, Ser. No. 366,541
Int. Cl.³ G01H *1/46*
U.S. Cl. 381—1.05 **16 Claims**



1. Output signal level control apparatus for use with a transducer instrument producing an electrical sound output signal, comprising:

(a) input terminals, for coupling to a transducer instrument to obtain the electrical sound output signal;

(b) a first attenuator coupled to said input terminals, for receiving said electrical sound output signal and reducing the level of the signal to produce a first level-controlled electrical sound output signal;

(c) a second attenuator coupled to said input terminals, for receiving said electrical sound output signal and reducing the level of the signal to produce a second level-controlled electrical sound output signal of a level different from the level of said first attenuated signal;

(d) a bistable circuit, for producing first and second oppositely-phased electrical control signals;

said bistable circuit toggling between states and changing said control signals between first and second signal levels in response to an electrical pulse signal input thereto;

(e) means for producing said electrical pulse signal, for toggling said bistable circuit;

(f) a first switch element controlled by said first bistable circuit control signal, said switch element being coupled to said first attenuator and passing said first level-controlled electrical sound output signal therethrough when said first control signal is at one of its two levels;

(g) a second switch element controlled by said second bistable circuit control signal, said switch element being coupled to said second attenuator and passing said second level-controlled electrical sound output signal therethrough when said second control signal is at one of its two levels;

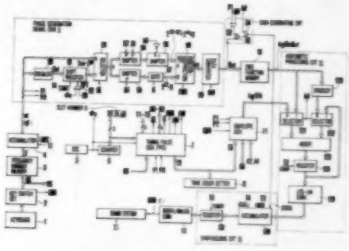
(h) output terminals coupled to said first and second switch elements for providing access to a level-controlled electrical sound output signal.

4,418,600

ELECTRONIC MUSICAL INSTRUMENTS OF THE TYPE SYNTHESIZING A PLURALITY OF PARTIAL TONE SIGNALS

Masatada Wachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 17, 1981, Ser. No. 293,699
Claims priority, application Japan, Sep. 8, 1980, 55-124930
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.19 **11 Claims**



1. An electronic musical instrument comprising:

phase designation signal generating means for generating first and second phase designation signals on a time division basis, said first and second phase designation signals representing one phase angle value and another phase angle value respectively;

memory means connected to said phase designation signal generating means for storing one predetermined waveshape and for delivering a tone signal in response to said first phase designation signal and delivering a window signal in response to said second phase designation signal on a time division basis, both the form of said tone signal and the form of said window signal being the same as that of said predetermined waveshape;

modulation means for amplitude-modulating said tone signal in accordance with a modulation signal corresponding to said window signal and for outputting the modulated tone signal; and

tone production means for producing a musical tone in response to said modulated tone signal.

9. In an electronic musical instrument in which a musical tone is synthesized by calculating successive sample point amplitudes, each such amplitude being the sum of contributions of plural partial tone components, each being evaluated by scaling a frequency signal by a window function, the improvement comprising:

a waveform memory storing sampled amplitude values of a waveshape,

first means for accessing said waveshape from said memory at

a first rate, said waveshape accessed by said first means establishing said frequency signal, and

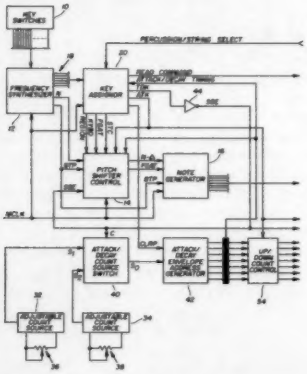
second means, operative in time shared relationship with said first means, for accessing said waveshape from said memory at a second rate different from said first rate, said waveshape accessed by said second means establishing said window function, whereby the shapes of said frequency signal and said window signal both are established by the same waveshape stored in a single memory.

4,418,601

STRING SNUB EFFECT SIMULATION FOR AN ELECTRONIC MUSICAL INSTRUMENT

John T. Whitefield, Harleysville, Pa., assignor to Allen Organ Company, Macungie, Pa.

Filed Apr. 15, 1982, Ser. No. 368,495
Int. Cl.³ G10H *1/057*
U.S. Cl. 84—1.26 **10 Claims**



1. In an electronic musical instrument having a greater number of selectively actuable keys or switches than tone generators of the type wherein tones corresponding to the respective notes of a musical scale are produced by reading from memory stored sample points of harmonic structures of waveforms and envelopes characteristic of the selected waveforms, and by interpolating between said harmonic structures of the waveforms during the transient periods of said waveforms, an apparatus for causing a snubbing of the tone produced in response to the depression of at least one key comprising:

means for selecting a percussive string-type waveform and for generating a signal indicative of such selection;

means for detecting the release of a depressed key and the presence of the signal indicative of the selection of a percussive string-type waveform and for generating a signal indicative of such detection;

means for halting further interpolation of the selected waveform and switching to a preselected harmonic structure of said selected waveform;

means for variably controlling the envelope amplitude, shape and rate of decay of the selected waveform;

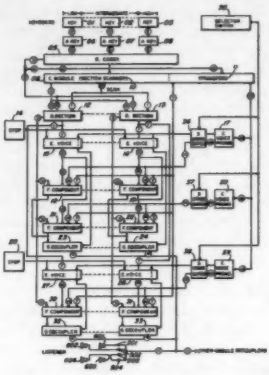
said last two recited means being actuable in response to the signal indicative of the detection of the release of the depressed key and the signal indicative of the selection of a percussive string-type waveform for the duration of the transient period causing a snubbing of the produced tone.

4,418,602

TRANSFER ORGAN

William D. Turner, 12804 Cedarbrook La., Laurel, Md. 20708

Filed Jul. 13, 1982, Ser. No. 397,695
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.26 **3 Claims**



1. An improved electronic transfer organ, comprising in combination:

at least one keyboard having a multiplicity of keys, each said key corresponding to at least one of a multiplicity of nominal pitches to be sounded, each said nominal pitch having associated therewith a range of permissible pitches such that any pitch within that range will be musically acceptable as within the limits of optimal mistuning for that nominal pitch, each said permissible pitch having associated with it harmonics thereof, said permissible pitch and its harmonics being defined herein as a permissible note, at least some of said harmonics having envelopes of attack and decay which are similarly shaped and therefore constitute a component of said permissible note having a composite wave form formed by the waveforms of each of said harmonics;

stop means having at least one stop, each said stop corresponding to a voice to be sounded;

a first group of large memory pairs for a first voice-temperament combination, said group consisting of at least one large memory pair comprising (a) a large waveform-memory having stored therein individualized information comprising the composite waveform of one component of a permissible note associated with a nominal pitch, said component comprising harmonics of the said pitch which harmonics have similarly shaped envelopes of attack and decay, and (b) a large envelope-memory having stored therein information which is individualized regarding the amplitude, frequency, duration of attack and decay, envelope of attack and decay, and spatial position of the said component;

at least one additional group of large memory pairs for at least one additional voice-temperament combination, means for member-actuated selection of one of said groups of large memory pairs thereby enabling voices of the said improved organ to be played in one or more voice arrays and tone temperaments;

at least one array of small memory pairs corresponding to each said large memory pair, said small memory pairs being substantially identical to each other, the number of said small memory pairs in each array being equal to the number of keys that may be desired to activate concurrently;

means responsive to depression of any key to activate one of said small memory pairs in each array to receive information and cause transfer from each of said corresponding

large memory pairs of the said individualized information therein corresponding to that depressed key to the respective small memory pairs corresponding to the depressed key for temporary storage therein;

means for causing activation of any stop to convert the information temporarily stored in each small memory pair corresponding to that stop and the depressed key into a signal corresponding to the said component of said permissible note, each said signal being individualized with respect to the composite waveform, frequency, amplitude, duration of attack and decay, envelope of attack and decay, and spatial position of the said component of the permissible note corresponding to the depressed key;

means for producing four amplitude-multiplication factors characteristic of the position of said permissible note in two-dimensional space; and

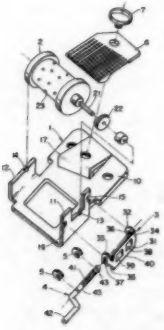
means responsive to said signal and said four amplitude-multiplication factors for generating sounds whose combined acoustic image approximates the acoustic image of an individualized sound source located at said position.

4,418,603

DRIVE SHAFT SUPPORTING DEVICE FOR A MUSIC BOX WITH A PLATE FRAME

Akihiko Isaka, Okaya, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Shimosuwa, Japan

Filed Feb. 1, 1982, Ser. No. 344,690
Claims priority, application Japan, Feb. 17, 1981, 56-20112[U]
Int. Cl.³ G10F *1/06*
U.S. Cl. 84—95 R **5 Claims**



1. A device for supporting a drive shaft in a music box having a drum supported by a second shaft, comprising:

a U-shaped steel plate frame having first and second side plates which extend upwardly from opposite ends of a first base plate, said first side plate having engaging grooves formed in both end portions thereof;

an elastic U-shaped retaining plate comprising a second base plate having elastic pieces and third and fourth side plates which extend from opposite ends of said second base plate, said third and fourth side plates having engaging portions therein for engaging said engaging grooves;

said engaging portions being engaged with said engaging grooves with said elastic pieces abutted against an outer wall of said first side plate;

said third side plate having a bearing hole for rotatably supporting a drive shaft, said fourth side plate having a U-shaped bearing groove which opens towards said drive shaft, said drive shaft being insertable into said U-shaped bearing groove;

bearing means formed in said first and second side plates for supporting said second shaft;

a gear mounted on said second shaft and being engageable with a worm in said drive shaft for driving said drum;

a vibration plate having vibration reeds; and

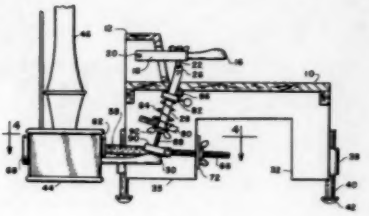
means for mounting said vibration plate to said first base plate so that said vibration reeds on said vibration plate are snapped by pins on said drum.

4,418,604

PIANO PEDAL EXTENSION

Jaime S. Kim, 21875 Hathaway Ave., Apt. #2, Hayward, Calif. 94541

Filed Jul. 8, 1982, Ser. No. 396,414
Int. Cl.³ G10G *7/00*; G10C *3/14*
U.S. Cl. 84—232 **6 Claims**



1. A piano pedal extension comprising:

a table having four corner legs and threaded vertical table height-adjusting rods connected to each of said corner legs;

a pedal box mounted on the top of said table adjacent a first edge thereof, said pedal box having a plurality of vertical openings in the front face thereof, said box pivotally supporting a corresponding number of auxiliary piano-type pedals, one pedal of said plurality passing through each of said vertical openings and extending substantially horizontally outward above said table top;

a plurality of adjustable length connecting shafts each coupled at a first end to one of said plurality of auxiliary pedals, the second end of each connecting shaft being connected to a pedal block for resting on a piano pedal, each of said connecting shafts being constrained for axial movement upon the depressing of the auxiliary pedal coupled thereto;

spring means mounted to each of said plurality of connecting shafts for applying a lifting force that substantially balances the weight of the connecting shaft and its respective auxiliary pedal; and

clamping means for firmly clamping said table to at least part of a piano pedal box and in a position at which each of said pedal blocks at the second end of each of said plurality of connecting shafts rests on a piano pedal, said clamping means including:

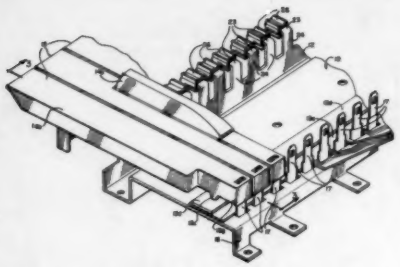
a threaded tubular member having first and second ends, said member having at its first end a plate for contacting a first surface of a piano pedal box, said tubular member being threaded into a correspondingly threaded swivel nut mounted for pivotal movement about its vertical and horizontal axes and adjustable in a vertical direction and in a horizontal direction perpendicular to the axis of said tubular member; and

a threaded rod coaxial with said threaded tubular member and axially adjustable within said tubular member, said threaded rod having at its first end a second plate for engaging a second surface of said piano pedal box that is substantially opposite said first pedal box surface, said threaded rod extending through the second end of said tubular member and through the slot in a horizontally slotted member coupled to said table and horizontally adjustable thereto, said threaded rod being firmly connected in said slot by a correspondingly threaded nut.

4,418,605
KEYBOARD FOR MUSICAL INSTRUMENT

Kjell T. Tollefsen, and Albert W. Nordquist, both of Ivoryton, Conn., assignors to Pratt-Read Corporation, Ivoryton, Conn.

Filed Jun. 25, 1980, Ser. No. 162,914
Int. Cl.[3] G10C *3/12*
U.S. Cl. 84—434 34 Claims

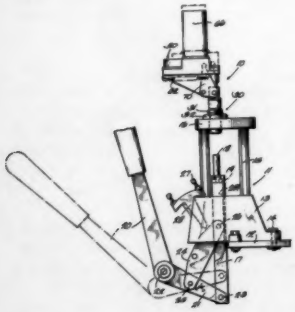


1. A keyboard for a musical instrument comprising
a plurality of elongated keys each having a longitudinal dimension,
a bendable pivot spring for each key having second mating means,
key bed means for rigidly holding one end section of each pivot spring, and
each key having a chamber in a rear section defining a lower opening, said chamber having formed therein first mating means for receiving the second mating means of an associated pivot spring free of a separate fastening device between key and pivot spring, the first and second mating means being removably received rigidly one in the other whereby the pivot spring extends in a direction generally perpendicular to the key longitudinal dimension to form the sole rear (1) pivot, (2) biasing, (3) guidance and (4) support about which the key can rotate in a single plane only.

4,418,606
POWDER MEASURING DEVICE FOR CARTRIDGE RELOADER

Richard J. Lee, 3146 Kettle Moraine Rd., Hartford, Wis. 53027

Filed Apr. 15, 1983, Ser. No. 485,148
Int. Cl.[3] F42B *33/02*
U.S. Cl. 86—31 11 Claims

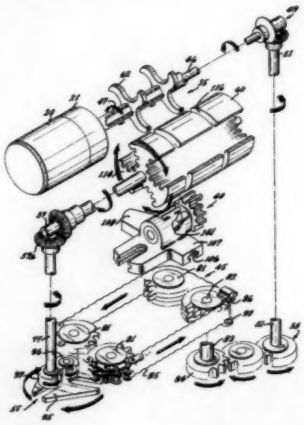


1. A device for measuring the quantity of powder that is inserted in a cartridge in a reloading apparatus having means for driving the cartridge in alternate axial directions and having a support for the device, said device comprising:
an adapter for being mounted on said support and having an axial bore,
a tubular element in the adapter bore, said element subject to being driven in one axial direction in said bore by a force transmitted through a cartridge being driven into said bore in alignment with said element,
a body supported from said tubular element outside of said adapter,
a powder transport member mounted for moving on said body, said member having at least one cavity corresponding in size to the quantity of powder desired in the cartridge, said cavity being located for being loaded with a quantity of powder when said member is in one position and for discharging said quantity through said tubular element into said cartridge when in another position, and
drive means engaged with said transport member and responsive to said tubular element being driven in said one axial direction by said force transmitted through a cartridge by driving the transport member alternately between cavity loading position and cavity discharge position.

4,418,607
SINGLE BARREL EXTERNALLY POWDERED GUN

Leonard W. Price, Marina Del Rey, Calif., assignor to Hughes Helicopters, Inc., Culver City, Calif.

Continuation of Ser. No. 789,502, Apr. 21, 1977, abandoned, which is a continuation of Ser. No. 418,356, Nov. 23, 1973, abandoned. This application Sep. 18, 1981, Ser. No. 303,705
Int. Cl.[3] F41D *10/04*
U.S. Cl. 89—33 CA 22 Claims



1. A gun comprising
a housing;
a single gun barrel having a longitudinal axis and disposed within said housing;
a single gun bolt disposed within said housing and journaled for reciprocation along said longitudinal axis;
an operating mechanism for said gun bolt;
means for feeding rounds of ammunition to and from said gun bolt;
coupling means interengaging said operating mechanism and said feeding means; and
said feeding means including a first rotating sprocket transfer means and second transfer means,
said first rotating sprocket transfer means, driven by said coupling means in a rotational manner different from said second transfer means, and engaging each round of a train of rounds for advancing a train of rounds of ammunition directly to a second transfer means, and

said second transfer means including at least one round receiving pocket, driven by said coupling means in a rotational manner different from said first rotating sprocket transfer means, for receiving a round of ammunition from said first transfer means and for translating said round transversely to said longitudinal axis to the face of said gun bolt.

4,418,608

ARRANGEMENT FOR PRE-SELECTING THE CADENCE OF FIRING BURSTS OF A PRESSURIZED GAS LOADER OF A GUN

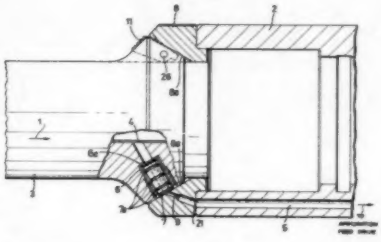
Walter Klumpp, Duisburg, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 16, 1981, Ser. No. 244,019

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011172

Int. Cl.³ F41D *5/08*

U.S. Cl. 89—193 **10 Claims**



1. In an arrangement for preselecting the cadence of firing bursts in a machine cannon having a pressurized gas loader operatively mounted in the housing of the machine cannon, said arrangement including means for conducting a portion of the gases formed during firing to the driving means of the weapon, said conducting means having a passage and being provided with means to adjust the cross-section thereof to thereby preselect the cadence of the firing burst, the improvement comprising in combination,

said conducting means including at least one first conduit disposed in the walls of the gun barrel and at least one second conduit disposed in the housing of the weapon and in operative communication with the gas loader thereof;

a ring body operatively mounted on said housing coaxially with respect to said gun barrel and housing and between said first and second conduits;

said ring body having a plurality of passages disposed therein of different cross-sections, the outlet ends of said passages being disposed along a circular arc in said ring body which intersects the axis of said second conduit means;

a selected one of said passages forming a conduit for the gases formed at firing from the outlet of the first conduit to the inlet of the second conduit to conduct said gases to a driving piston of the gas loader of the weapon.

4,418,609

WELL PUMPING SYSTEM

Richard A. Wickline, Mansfield, and Richard Y. Wickline, Fort Worth, both of Tex., assignors to Wickline, Saginaw, Tex.

Filed Mar. 16, 1981, Ser. No. 244,239

Int. Cl.³ F01L *25/08*; F15B *11/08*

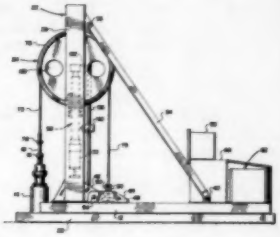
U.S. Cl. 91—275 **14 Claims**

1. A pumping unit for actuating a linear reciprocable pump rod extending from a wellhead, said pumping unit comprising:

a frame including an elongated horizontally extending base portion and a vertically extending portion mounted on said base portion, said vertically extending portion comprising a single pair of opposed spaced apart vertically extending beam members interconnected by at least one generally horizontal transverse crossbeam member at a point below the upper ends of said vertically extending beam members, two opposed guide members supported on said vertically extending beam members, respectively, and extending substantially vertically and parallel to each other;

a single travelling pulley assembly including a crossbar and a pair of sheaves rotatably mounted on said crossbar, a pair of opposed bearings supported on opposite ends of said crossbar and adapted to be engaged by said guide members, respectively, and above said crossbeam member for linear reciprocating movement along said vertically extending portion of said frame;

a linear extensible hydraulic cylinder and piston assembly supported at one end on said frame and connected at its opposite end to said pulley assembly;



a pair of flexible cable means anchored at one end to said frame, said flexible cable means being trained over said sheaves, respectively, and secured to said pump rod for linear reciprocation of said pump rod in response to actuation of said cylinder and piston assembly to move said pulley assembly vertically in said guide members through a clear path of reciprocation between said vertically extending beam members whereby said pulley assembly may be at least partly extended above the upper ends of said vertically extending beam members during reciprocation by said cylinder and piston assembly, and said pulley assembly may be inserted in and removed from between said vertically extending beam members from said upper ends of said vertically extending beam members, respectively.

4,418,610

ELECTROHYDRAULIC CONTROL SYSTEM

John W. Holtrop, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 8, 1980, Ser. No. 185,036

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—368 **4 Claims**

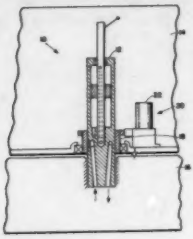
1. A hydraulic system for positioning a movable member which is mounted for rotation about an axis, said hydraulic system comprising:

actuator means for positioning said movable member, said actuator means being connected to said movable member and responsive in rotation about said axis to hydraulic fluid under pressure;

valve means operatively connected to said actuator means for controlling said hydraulic fluid, said valve means being actuatable between a first state preventing transmission of hydraulic fluid pressure to said actuator means and conduction of hydraulic fluid from said actuator means and at least one additional state permitting transmission of hydraulic fluid pressure to said actuator means and conduction of hydraulic fluid from said actuator means, said

valve means being configured for movement about said axis; and

servo control means responsive to a control signal and operatively connected to said valve means for controlling said valve means between said first state and said additional state, said servo control means being attached to said movable member and movable about said axis.



4,418,611

PNEUMATIC SERVO BOOSTER

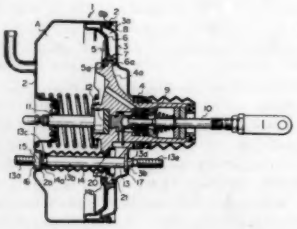
Kiyoshi Tateoka, Fujisawa, and Yoshihiro Hayashida, Chigasaki, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Continuation of Ser. No. 170,876, Jul. 21, 1980, abandoned. This application Jun. 25, 1982, Ser. No. 392,141

Claims priority, application Japan, Jul. 20, 1979, 54-101243

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—369 A **3 Claims**



1. A pneumatic servo booster comprising:

a shell housing having a front and rear shell;

a valve body positioned inside said housing and slidably supported by said rear shell, said valve body having a valve mechanism therein;

a partitioning member cooperating with said valve body for partitioning the interior space of said housing into a front and rear chamber, said partitioning member having a bore therethrough;

a connecting rod axially extending through the front and rear chamber and freely extending through said bore, the rear end of said rod being welded to said rear shell and the front end of said rod extending through said front shell and being threaded;

a nut threaded onto said front end of said rod;

an integral tubular extensible member surrounding a portion of said rod, one end of said tubular member being sealingly attached to the peripheral edge of said bore and having the portion of the rod adjacent the rear end and within said rear shell passing freely through said tubular member, the other end of said tubular member being sealingly attached to said rod adjacent and within said front shell, said nut when tightened onto said rod drawing the forward end of said tubular member into sealing engagement with the inner surface of said front shell around the aperture in said front shell through which the front end of said rod extends.

4,418,612

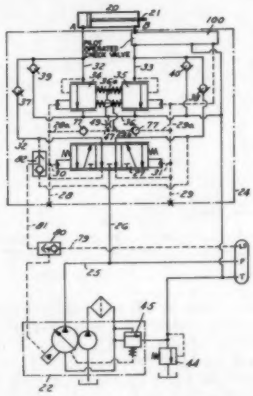
POWER TRANSMISSION

Vinod K. Nanda, Rochester, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed May 28, 1981, Ser. No. 267,853

Int. Cl.³ F15B *13/04*

U.S. Cl. 91—445 **6 Claims**



1. A hydraulic control system comprising

a hydraulic actuator having opposed openings adapted to alternately function as inlets and outlets for moving the element of the actuator in opposite directions,

a pump for supplying fluid to said actuator,

a meter-in valve means to which the fluid from the pump is supplied,

said valve being pilot controlled,

a pilot controller for alternately supplying fluid at pilot pressure to said meter-in valve means for controlling the direction of movement of the meter-in valve,

a pair of hydraulic lines extending from said meter-in valve means to said respective openings of said actuator,

a normally closed meter-out valve associated with each opening of the actuator for controlling the flow out of said actuator,

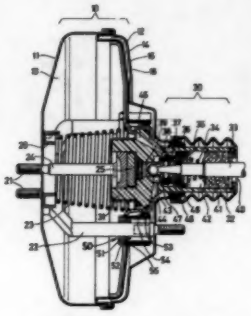
each said meter-out valve being pilot operated by the pilot pressure from said controller,

and a pilot operated check valve in one of said pair of lines between said actuator and its respective meter-out valve operable for controlling flow from the meter-in valve means to one end of said actuator and for preventing flow out said end of said actuator, said pilot operated check valve being operable at a lower pilot pressure than said meter-out valve means such that said check valve opens before its associated meter-out valve opens, said check valve including time delay means such that said valve functions to prevent flow out of said actuator after a predetermined time delay from the time when pilot pressure to said meter-out valve means is interrupted, insuring relief valve protection.

4,418,613
VACUUM BRAKE BOOSTER

Rolf Weiler, and Peter Böhm, both of Frankfurt, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 121,552, Feb. 14, 1980, abandoned.
This application Nov. 20, 1981, Ser. No. 323,625
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908516
Int. Cl.³ B60T 13/00
U.S. Cl. 92—98 D 11 Claims



1. A brake booster utilizing the differential of pressure between a vacuum and atmosphere pressure comprising:

a vacuum casing having a longitudinal axis and at least one movable wall disposed therein in a transverse relationship to said axis to divide said casing into a vacuum chamber and a working chamber, said movable wall including a main rolling diaphragm and a diaphragm plate, said movable wall acting on a push rod guided along said axis;

at least two bars disposed in said casing spaced from and parallel to said axis connected to the transverse spaced end walls of said casing and penetrating said movable wall;

at least two tubular members each connected to said movable wall and surrounding a different one of said bars in a spaced relationship thereto in an area where an associated one of said bars penetrates said movable wall; and

at least two small rolling diaphragms having one end fastened to and surrounding an outer circumferential surface of an associated one of said bars and the other end fastened to said movable wall, each of said small rolling diaphragms being disposed between said outer surface of an associated one of said bars and an inner surface of an associated one of said tubular members and completely enclosed by said associated one of said tubular members to slidably seal said bars to said movable wall, each of said small rolling diaphragms being axially guided and radially confined in an associated one of said tubular members.

4,418,614
CONTROL DEVICE FOR COFFEE EXTRACTOR

Hiroyuki Oota, Iwakura, and Ryuuho Narita, Nagoya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 18, 1982, Ser. No. 340,251
Claims priority, application Japan, Jan. 19, 1981, 56-5926[U]; Jan. 23, 1981, 56-9430
Int. Cl.³ A47J 31/00
U.S. Cl. 99—280 5 Claims

1. A control device for a coffee extractor having a series circuit, connected between output terminals of a power source and including an electric heater for boiling water and a control switch for controlling the ON/OFF operation of said electric heater; and a drip mechanism which drips coffee by supplying hot water to a case which stores coffee powder, wherein said control device comprises:

a drive circuit which controls the ON/OFF operation of said control switch in response to an ON instruction signal or an OFF instruction signal;

a pulse generator which is connected between said output terminals of said power source for generating a count pulse of a predetermined period;

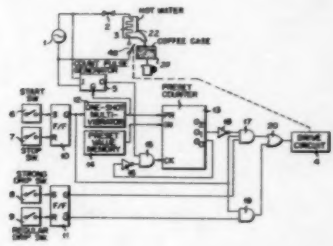
a start switch which generates a start signal;

a regular drip switch for dripping regular coffee of a first concentration and a strong drip switch for dripping strong coffee of a second concentration;

a memory which stores a selectively operated condition data of said regular drip switch and said strong drip switch;

a counter which is preset with a first count data when said start switch is operated, and which has a first output terminal producing a first level output only when said counter has a specific second count data by the way in which said preset first count data is counted down by one each time said counter receives said count pulse and a second output terminal producing said first level output only when said counter has a predetermined third count data;

a first logic circuit which couples an input side of said counter, said start switch and said count pulse generator with one another; and



a second logic circuit which couples an output side of said counter, said drive circuit and said memory with one another;

said second logic circuit including first and second discriminating circuits;

said first discriminating circuit being controlled to supply said ON instruction signal to said drive circuit if said counter does not retain said specific second count data when said memory circuit stores the operated condition data of said strong drip switch and said start switch is operated, controlled to supply said OFF instruction signal to said drive circuit when said counter becomes to retain said specific second count data, and conrolled to supply again said ON instruction signal to said drive circuit when said counter becomes not to retain said specific second count data; and

said second discriminating circuit being controlled to supply said ON instruction signal continuously to said drive circuit when said memory circuit stores the operated condition data of said regular drip switch and said start switch is operated.

4,418,615
CONVECTION BARBECUE PIT

Michael R. Higgins, P.O. Box 522, Mesquite, Tex. 75149

Filed Jun. 24, 1982, Ser. No. 391,676
Int. Cl.³ A47J 27/62
U.S. Cl. 99—331 16 Claims

1. A thermostatically controlled convection barbecue pit, comprising:

a firebox comprising a firebox access door, a firebox outlet port, and a firebox inlet port;

thermostatically controlled firebox damper means for regulating the passage of air through said firebox inlet port into said firebox;

a cooking chamber having at least one cooking chamber

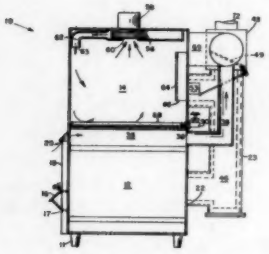
access door, said cooking chamber having an inlet port and a first and second cooking chamber outlet port on opposite sides of said cooking chamber inlet port;

a joinder flue connected at a lower end to said firebox and at an intermediate end to said cooking chamber for the passage of smoke from said firebox through said firebox outlet port into said cooking chamber through said cooking chamber inlet port;

a plenum chamber connected to said joinder flue at an upper end of said joinder flue, said plenum chamber having a dual function bypass damper means therein capable of alternatively directing smoke from said firebox into said cooking chamber or permitting direct exhaust of smoke from said firebox;

a baffle secured within said cooking chamber adjacent to said cooking chamber inlet port for urging smoke from said joinder flue upward within said cooking chamber;

a discharge duct mounted to the ceiling of said cooking chamber comprising a suction port, a discharge vent, and a convection fan mounted within said discharge duct above said suction port, said discharge duct shaped to urge smoke forward within said discharge duct in a line



parallel to the ceiling of said cooking chamber and then downward through said discharge vent in a line parallel to said cooking chamber access door;

a first outlet duct secured within said cooking chamber adjacent to said first cooking chamber outlet port and a second outlet duct secured within said cooking chamber adjacent to said second cooking chamber outlet port for withdrawing smoke from the bottom of said cooking chamber on either side of said baffle;

a first cooking chamber outlet flue connected at a first end to said cooking chamber and at a second end to said plenum chamber and a second cooking chamber outlet flue connected at a first end to said cooking chamber and at a second end to said plenum chamber for receiving smoke from said cooking chamber through said first and second outlet ports and channeling said smoke into said plenum chamber;

an exhaust stack secured to said plenum chamber, said exhaust stack having mounted therein a stack fan for urging smoke from said plenum chamber through said exhaust stack; and

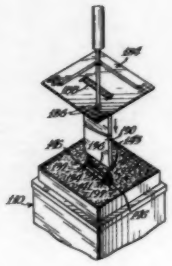
thermostatically controlled gas burner means capable of emitting a forced air flame into said firebox.

4,418,616

METHOD AND APPARATUS FOR DRAINING WHEY FOR MAKING LARGE SIZED BLOCKS OF CHEESE

Robert R. Streeter; Vincent J. Whitehorn, both of Pollock, S. Dak., and Earl C. Nicholas, Carthage, Mo., assignors to L. D. Schreiber Cheese Co., Inc., Green Bay, Wis.

Division of Ser. No. 56,088, Jul. 9, 1979, Pat. No. 4,263,330.
This application Mar. 30, 1981, Ser. No. 249,222
Int. Cl.³ A01J *25/11, 25/13, 25/15*
U.S. Cl. 99—458 **25 Claims**



1. An apparatus for manufacturing blocks of cheese from cheese curd particles containing whey comprising:

an open ended container for holding the cheese curd particles,

a drain plate enclosing the bottom of said container, said drain plate having a plurality of perforations,

drain screen means positioned in said container, said drain screen means including two substantially parallel, narrowly spaced-apart sidewalls having a multiplicity of openings,

spacing means defined by at least one of said sidewalls of said drain screen means comprising a plurality of integrally formed dimples that protrude outwardly and are adapted to engage the opposing sidewall for maintaining said two sidewalls in parallel, spaced-apart relation when said drain screen means is positioned in said container,

said sidewalls being separable from each other by relative generally outward movement when removed from said container to facilitate assembly and disassembly of said drain screen means,

said drain screen means being positioned in said container wherein the space between said sidewalls is in communication with at least some of said perforations in said drain plate, said drain screen means being of substantially parallel construction throughout its extent in the container and being of sufficient width and height in relation to the container such that the whey has a relatively short distance to travel to said drain screen means and thus is easily drainable over substantially the entire volume of said cheese curd whereby whey received in said drain screen means is allowed to flow out of said container.

4,418,617

APPARATUS FOR CRACKING NUTS AT HIGH PRODUCTION RATES

James B. Quantz, Columbia, S.C., assignor to Machine Design Incorporated, Columbia, S.C.

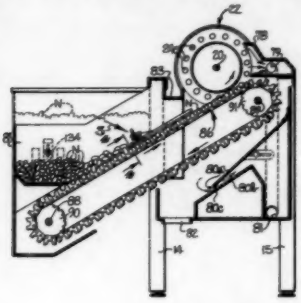
Division of Ser. No. 199,743, Oct. 23, 1980, Pat. No. 4,332,827.
This application Apr. 27, 1982, Ser. No. 372,305
Int. Cl.³ A23N *5/02*
U.S. Cl. 99—571 **25 Claims**

1. A high production nutcracking apparatus comprising,

means for advancing a plurality of nuts individually in succession along a first path of travel with at least substan-

tially all of the advancing nuts being disposed in a predetermined orientation,

means for removing the advancing nuts in succession from the first path of travel at the terminal end thereof and advancing the removed nuts in succession along a generally curvilinear second path of travel, and including means for clampingly engaging each nut during its removal from



the first path of travel and advance along the second path of travel so as to preserve the predetermined orientation of each nut, and

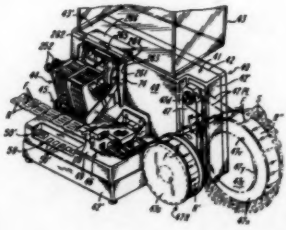
means for imparting a cracking force to each nut while being advanced along the second path of travel, and with the cracking force being applied in a direction corresponding to the clamping engagement of the nut.

4,418,618

LABEL PRINTING APPARATUS WITH CONSTANT PRESSURE PRINTING MECHANISM

Orville C. Huggins, Dayton, and John D. Mistyurik, Tipp City, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Feb. 17, 1982, Ser. No. 349,495
Int. Cl.³ B41K *45/00*
U.S. Cl. 101—68 **6 Claims**



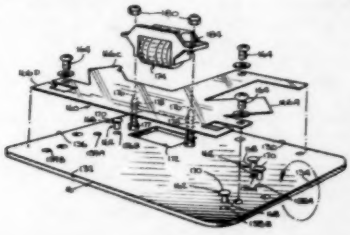
1. Printing apparatus, comprising: a platen, a print head, means for guiding the print head for straight line movement, means for driving the print head into and out of printing cooperation with the platen, an impression control device including a stop movable between effective and ineffective positions, the stop preventing movement of the print head toward the platen in its effective position, a spring loaded by the driving means when the print head is stopped by the stop, an interposer in contact with the stop to hold the stop in its effective position, the driving means being effective after the driving means has moved through a predetermined distance to shift the interposer and to enable the stop to move to its ineffective position to cause the print head to be driven into printing cooperation with the platen, wherein the interposer includes a bar, a pair of tension springs for urging the bar in one direction, means for guiding the bar, wherein the stop includes a pair of spaced latches having stop faces, means pivotally mounting the latches about a common pivot axis, the latches having respective shoulders for limiting the movement of the bar against the urging of the springs, the stop faces being in a path adjacent the print head, the stop faces being located offset from the pivot axis to cause the latches to be cammed out of the path when the bar is in its ineffective position, and the drive means including a member movable in the space between the latch members for shifting the bar in the opposite direction against the action of the springs to enable pivotal movement of the latch members and release of the print head.

4,418,619

IMPRINTING APPARATUS WITH RELOCATABLE PRINTING DEVICE

Paul A. Diel, Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 11, 1982, Ser. No. 338,699
Int. Cl.³ B41F *3/04*
U.S. Cl. 101—269 **12 Claims**



1. Imprinting apparatus comprising:

a. framework;

b. a printing device;

c. a roller platen movably attached to the framework, said roller platen being movable from a print ready position to a home position, said roller platen disposed for urging a pressure sensitive medium into imprinting engagement with the printing device in the course of movement thereof; and

d. means for supporting said printing device, said supporting means including an anvil, said anvil having opposed major surfaces, said supporting means including means removably attaching said anvil to said framework for carrying said printing device in either of two different locations relative to the print-ready position of said roller platen, and said carrying means attaching said anvil to said framework to permit facing either of said major surfaces toward said roller platen for carrying said printing device in one of said locations when one of said major surfaces is so faced and in the other of said locations when the other of said major surfaces is so faced.

4,418,620

OFFSET PRINTING MACHINE INK DISTRIBUTION AND DRYING SYSTEM

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

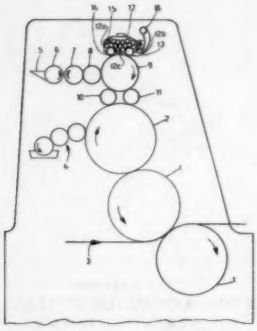
Continuation of Ser. No. 186,423, Sep. 12, 1980, abandoned. This application Apr. 7, 1982, Ser. No. 366,239

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942691

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ B41F *31/10, 7/12*

U.S. Cl. 101—350 15 Claims



1. In an offset printing machine having a plate cylinder (2) and an inking system including

an ink trough (5);

an ink duct roller (6) receiving ink from the ink trough (5);

an ink distribution roller (9);

and a plurality of ink rollers (7, 8, 10, 11) conducting ink from the ink duct roller to the ink distribution roller and from the ink distribution roller to the plate cylinder (2) and forming, with said ink distribution roller, an ink roller train,

apparatus for distributing and drying ink in the ink roller train comprising

a cage-like holder (12) open to the atmosphere having confining side walls and a closed bottom wall (12*c*);

two ink transferring rollers (13, 14) having an ink accepting surface projecting from the cage-like holder,

and a plurality of loose roller elements (15) freely centerless floatingly located in the cage-like holder (12), for centerless, self-positioned rolling movement between the confining side walls and the bottom wall of the cage, some of the roller elements being in surface engagement with said ink transferring rollers and some of the roller elements being in surface engagement with each other to increase the surface area of ink transported in the ink train,

the plurality of roller elements being of such number that the distance between the ink transferring rollers (13, 14) within the cage-like holder (12) is spanned by at least one of the roller elements, and which will assume positions between the ink transferring rollers, the plurality of roller elements (15) being rotated by surface frictional engagement with the ink transferring rollers (13, 14);

and wherein said cage-like holder (12) is positioned in said printing machine for engagement of both of the ink transferring rollers (13, 14) with spaced circumferential surface portions of said ink distribution roller (9) forming a single one of the rollers in the ink roller train,

said ink transferring rollers (13, 14) having a diameter substantially less than the diameter of said one ink distribution roller (9) and being positioned to span a portion of the circumference thereof.

4,418,621

MECHANISM FOR A ROTATING PROJECTILE FUZE

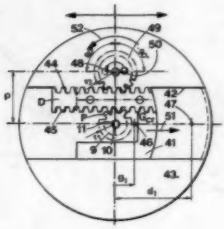
Jean Rosselet, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Mar. 23, 1981, Ser. No. 246,159

Claims priority, application Switzerland, Apr. 1, 1980, 2553/80

Int. Cl.³ F42C *15/22*

U.S. Cl. 102—238 4 Claims



1. Driving means for the timing fuze of a gyratory shell adapted primarily to cooperate with control, security and delay devices by providing them with a predetermined couple under the action of centrifugal force, said driving means comprising a primary movable body and at least one secondary movable body, said bodies meshing directly or indirectly with each other, each of said bodies provided with a center of gravity eccentric with respect to the axis of gyration of said shell and a toothed pinion for actuating said control, security and delay devices meshing with at least one of said two movable bodies, said two movable bodies driving said toothed pinion simultaneouly in the same direction.

4,418,622

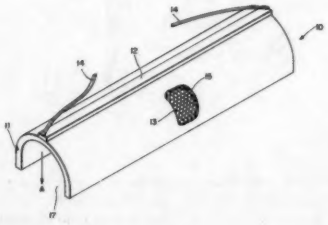
MUNROE EFFECT BREACHING DEVICE

John S. Foster, Fredericksburg, and John A. M. Zehmer, III, Newport News, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1982, Ser. No. 394,975

Int. Cl.³ F42B *1/02*

U.S. Cl. 102—307 10 Claims



1. A Munroe Effect device for breaching walls in urban terrain, comprising:

a metallic, honeycombed support structure formed to have concavo-convex surfaces over a linear extent; and

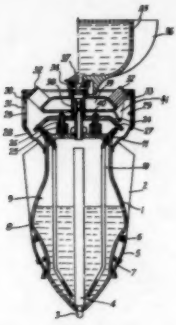
an explosive material completely covering said metallic, honeycombed support structure and filling the interstices thereof to define an unlined shaped charge;

whereby, upon detonation of said explosive material, the detonation wave melts said metallic, honeycombed support structure to produce a high velocity jet of molten metal directed outwardly from the concave surface for breaching walls in urban terrain.

4,418,623
APPARATUS FOR DISPERSING LIQUIDS

Fernand Gauchard, 87 Boulevard du Montparnasse, 75006 Paris, France

Filed Jul. 9, 1981, Ser. No. 281,879
Claims priority, application France, Jul. 9, 1980, 80 15255
Int. Cl.³ F42B 25/12
U.S. Cl. 102—369 6 Claims

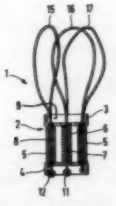


1. Apparatus for dispersing liquids, comprising a casing, a reservoir inside the casing for the liquid to be dispersed, at least one dispersing nozzle for the liquid in communication with the reservoir, means to place the liquid in the reservoir under pressure to ensure its atomization by said at least one nozzle, means to initiate dispensing of the liquid through the nozzles, and direct outlets for the atomized liquid, means for closing said direct outlets, and means to direct the atomized liquid through filter means when said outlets are closed, thereby to produce an aerosol.

4,418,624
AERODYNAMIC BRAKING ARRANGEMENT FOR PROJECTILE COMPONENTS WHICH ARE TO BE SALVAGED

Rauschert Willi, Altensitten; Bock Erich, and Rieger Gerald, both of Nuremberg, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jul. 30, 1981, Ser. No. 288,475
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029914
Int. Cl.³ F42B 5/26
U.S. Cl. 102—473 12 Claims

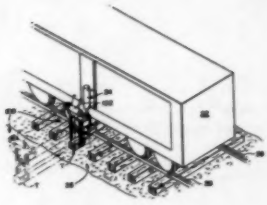


1. In an aerodynamic braking arrangement for projectile components which are to be salvaged, such as detonators; including a drag parachute havng a high air-resistance index; and cables interconnecting said projectile components with said drag parachute; the improvement comprising: said drag parachute being a brake basket having two cup-shaped tops at the ends thereof; at least one spacer separating said tops along the axial direction of said projectile, said cables being fastened to one of said tops.

4,418,625
BIDIRECTIONALLY OPERATIVE TIE EXCHANGING APPARATUS

Franz Allmer, Sophia, N.C., assignor to Canron Corporation, West Columbia, S.C.

Continuation-in-part of Ser. No. 274,768, Jun. 18, 1981. This application Apr. 13, 1982, Ser. No. 367,936
Int. Cl.³ B61D 15/00; B01B 29/06, 29/10
U.S. Cl. 104—9 21 Claims



1. A railway tie removing apparatus comprising:
an extensible beam means including first and second beams, one telescopically received within the other;
an adjustable support means for supporting said beam means relative to a support vehicle, said support means selectively adjustable to position said beam means relative to the axis of the tie to be removed;
selectively actuatable lock means for locking a selected one of said first and second beams to said support means;
tie gripping means mounted on said first and said second beams for selectively gripping a railway cross tie; and
force actuator means connected to said first and to said second beams for causing said first and said second beams to telescopically extend relative one another;
whereby actuating said locking means to lock one of the first and second beams to the support means and unlock the other and operating the force actuator means causes the unlocked other of the first and second beams to extend relative to the locked beam, and actuating said locking means to lock the other of the first and second beams to the support means and unlock the one and operating the force actuator means causes the unlocked one of the first and second beams to extend relative to the locked other beam.

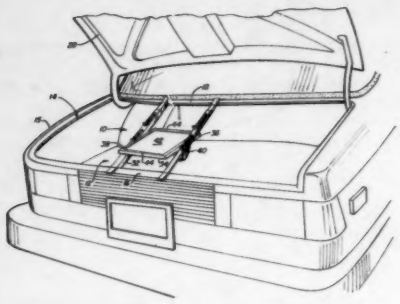
4,418,626
ARTICLE TRAY FOR AUTOMOBILES

George A. Semien, 2961 Dublin Dr., South San Francisco, Calif. 94080

Filed Mar. 12, 1981, Ser. No. 242,956
Int. Cl.³ A47F 5/12; A47B 9/00
U.S. Cl. 108—8 5 Claims

1. A tray mountable in an opening of a luggage compartment of an automotive vehicle, comprising:
tray structure including a planar outer surface;
a pair of elongate, longitudinally adjustable leg elements, each having an adjusted lengthwise dimension sufficient to extend between confronting peripheral portions of said luggage compartment opening, each leg element terminating in end structure configured to be placed in releasable, holding engagement with the periphery of the luggage compartment opening; and

means for pivotally coupling said leg elements to opposing lateral sides of said tray structure and in generally parallel



relation to one another, including means for releasably inhibiting relative movement therebetween.

4,418,627

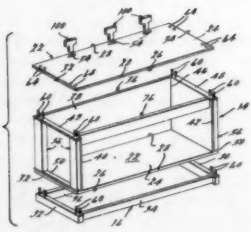
SHELF-TYPE STORAGE SYSTEM

Edward A. Baker, 35992 Woodridge Cir., Apt. 107, Farmington Hills, Mich. 48018

Filed Jan. 21, 1981, Ser. No. 226,634

Int. Cl.[3] A47B 7/00

U.S. Cl. 108—91 24 Claims



1. A shelf-type storage system comprising,

a plurality of vertically stackable individual shelf units,

each of said units including a generally rectangular-shaped, horizontally arranged shelf member,

a one-piece vertical liner member comprising spaced parallel end sections and a back section extending between and connected integrally to said end sections,

said liner member closing the ends and back of said shelf unit and providing a front opening to said unit though which objects may be placed upon and removed from said shelf member,

a plurality of four vertically extending post members disposed one on each corner of said shelf unit, and

alignment means extending generally vertically from selected ends of said post members and coacting with said liner member and said shelf member for securing said shelf member, liner member and post members in a unitized assembly adapted for vertical stacking on like units.

4,418,628

SECURITY TRANSFER ARRANGEMENTS

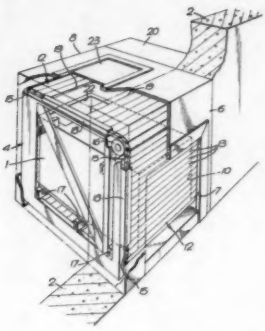
Dermot J. Cahill, Bedford, England, assignor to Chubb Security Installations Limited, London, England

Filed Sep. 1, 1981, Ser. No. 298,543

Claims priority, application United Kingdom, Sep. 10, 1980, 8029302

Int. Cl.[3] E05G 7/00

U.S. Cl. 109—19 10 Claims



1. A security transfer unit comprising means defining a chamber for receiving items to be transferred, casing means to enclose said chamber, said casing means having two manually-spaced openings therein to enable access to be gained for entering items into, and removing them from, said chamber, a flexible shutter encircling said chamber within said casing means for at times blocking access to said chamber through both openings, said shutter having at least one aperture therein, means mounting said shutter for displacement round said chamber within said casing means between a first position in which a said aperture in the shutter is located in register with a first of said openings while the second opening is blocked by the shutter, and a second position in which a said aperture in the shutter is located in register with the second opening while the first opening is blocked by the shutter, and means selectively operable externally of said casing means for displacing said shutter from one to the other of its first and second positions.

4,418,629

DEVICE FOR MAKING DARTS ON CUT PARTS OF GARMENTS

Günther Mall, and Willi Stephan, both of Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 234,756

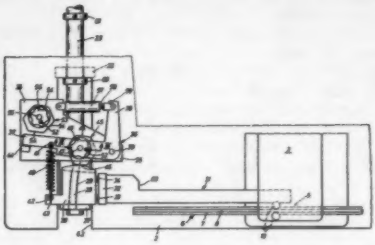
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 8027080[U]

Int. Cl.[3] D05B 35/08

U.S. Cl. 112—146 7 Claims

4. A device for making darts on cut parts for use with a sewing machine having a reciprocating needle mounted over a support table for engagement with the material to be sewn which is moved along the table by a feeding mechanism, comprising, a pleating bar support plate, means mounting said support plate for movement around the needle, a pleating bar carried by said support plate and being movable therewith for adjustable positioning in respect to the table, at least one stop mounted adjacent said pleating bar support plate and being adjustably positionable relative to said support table in the path of movement of said support plate to vary the end position of movement of said support plate which occurs when said support plate contacts said stop, said stop comprising a multi-step stop, a lever member pivotally mounted adjacent said pleating

bar and having first and second arm portions, said first arm portion carrying said stop, and a second stop mounted alongside said lever arm and being adjustably positionable relative to said lever arm to limit the movement of said lever arm.

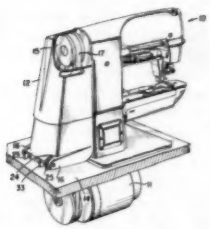


4,418,630

BELT GUARD LOCK

Richard P. Graham, Westfield, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Mar. 6, 1981, Ser. No. 241,329
Int. Cl.³ D05B *83/00*
U.S. Cl. 112—261 **3 Claims**



1. A belt guard for a sewing machine adopted for support in a sewing table having an upward facing surface, said sewing machine having a pulley supported at an end thereof, said sewing table supporting a drive motor therein, said drive motor being connected to said sewing machine pulley by at least one drive belt, guard means for preventing in a first position access to said pulley and said drive belt connection, means supported by said table for selectively pivotably supporting said guard in said first position for preventing an access to said drive belt connection of said sewing machine and in a second position for providing access to said drive belt connection, said supporting means being implemented by a pivot shaft affixed to said guard means and a pivot frame affixed to said sewing table, said pivot frame having an aperture for receiving said pivot shaft, said guard means having a lower edge spaced from said table surface in said first position and adjacent said table surface in said second position, wherein the improvement comprises:

means carried by said belt guard for selectively preventing and permitting rotation of said belt guard from said first position to said second position, said preventing means further comprising a collar slidable on said pivot shaft, a flange affixed to said collar and extending in said first position between said table surface and said guard means edge whereby said guard means is prevented from rotation about said pivot shaft to said second position;

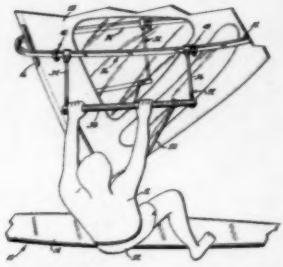
means for retaining said preventing means in an effective rotation preventing position against movement by tools available to a sewing machine operator.

4,418,631

APPARATUS FOR CONTROLLING A WIND PROPELLED SAILING DEVICE

Louis A. Frohbach, 7333 Oaklawn Ave., Edina, Minn. 55435

Filed Oct. 26, 1981, Ser. No. 314,731
Int. Cl.³ B63H *9/04*
U.S. Cl. 114—39 **8 Claims**



1. An apparatus for aiding a sailer in controlling a wind propelled sailing device, the wind propelled sailing device including a water engaging hull means and a sail means having a sail for receiving wind for motive power pivotally attached to the hull means and universally pivotable with respect to the hull means and having a substantially lateral boom for controlling the sail means, the boom being positioned about a lower end of the sail and along both sides of the sail, the apparatus comprising:

a substantially rigid U-shaped control member for transmitting forces from the sailer to the boom to control the steering of the sailing device, the control member having a pair of spaced-apart legs with spaced-apart first ends and having a handle portion extending between second ends of the legs, the handle portion being of sufficient length to permit grasping thereof by a pair of hands of the sailer so that the sailer can apply forces to the control member; and

connecting means for pivotally connecting the spaced-apart first ends of the spaced-apart legs to the boom to permit pivotal movement of the control member about an axis of the boom and to transmit forces perpendicularly to the axis from the handle portion through the spaced-apart legs to the boom.

4,418,632

METHOD FOR OPERATING A RIGID MARINE SAIL

Kazuhiko Yoshimi, Yokohama; Kazuyuki Shimizu, Fujisawa; Takashi Watari, Kamakura, and Katsunori Kusumoto, Yokosuka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Japan Marine Machinery Development Association, both of Tokyo, Japan

Filed Apr. 28, 1981, Ser. No. 258,543
Int. Cl.³ B63H *9/06*
U.S. Cl. 114—102 **2 Claims**

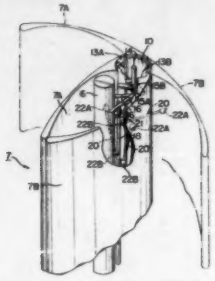
1. Method for operating a rigid marine sail having a rigid left sail portion and a rigid right sail portion, each of said rigid left and right sail portions having an inboard end and an outboard end, comprising:

providing a mast on a ship;

pivotally securing said left and right sail portions to said mast so as to be pivotable about one common pivot axis which extends substantially parallel to said mast, said one common pivot axis being spaced ahead of said mast with respect to the direction of intended movement of the ship;

selectively extending said left and right sail portions to an unfolded operable position by controllably pivoting said left and right sail portions about said one common pivot axis and selectively folding said left and right sail portions

to a streamlined folded inoperable position by controllably pivoting said left and right sail portions toward each other about said one common pivot axis so as to locate said mast between said left and right sail portions when said left and right sail portions are at said folded inoperable position, said left and right sail portions when being at



said folded inoperable position defining an essentially closed wing-shaped streamlined member wherein the inboard ends of said left and right sail portions are close to each other and face each other and the outboard ends of said left and right sail portions closely face each other to present a substantially streamlined form.

4,418,633

APPARATUS FOR CONTROLLING A WATERCRAFT

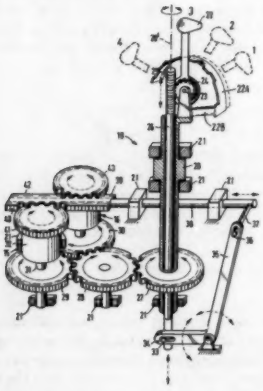
Franz Krautkremer, Spay, and Juergen Issleib, Hamburg, both of Fed. Rep. of Germany, assignors to Schottel-Werft, Josef Becker GmbH & Co. KG, Spay, Fed. Rep. of Germany

Filed Apr. 2, 1981, Ser. No. 250,486

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013654

Int. Cl.³ B63H *25/00*

U.S. Cl. 114—144 E **5 Claims**



2. An apparatus for driving and controlling a watercraft, comprising:

at least one pair of steerable propellers, the steerable propellers of each pair being located substantially symmetrically on opposite sides of the center plane of the watercraft, said center plane extending through the center of lateral resistance of the watercraft, said steerable propellers each being drivable to produce a directed thrust upon the watercraft for moving the latter;

a single control element for carrying out control movements in two degrees of freedom in relation to a common axis;

transmitters responsive to positioning of said control element to direct the thrust of respective ones of said steerable propellers;

means for presetting the locations of at least first and second fixed alternatively selectable positions of said control element in one of said two degrees of freedom;

means establishing a first path of actuation from said single control element to said transmitters and responsive to movement of said control element in the other said degree of freedom for pivoting of said steerable propellers of each pair in the same angular direction by the same angular amount;

the propellers of each pair having thrust directions which are parallel in said first fixed position of said control element, independent of pivoting of the steerable propellers by said movement of said control element in said second degree of freedom, for normal driving and maneuvering of said watercraft by said movement of said control element in said second degree of freedom;

means establishing a second path of actuation from said single control element to said transmitters and responsive to movement of said control element in said one degree of freedom from said first fixed position to said second fixed position for pivoting of said steerable propellers of each pair in opposite angular directions out of parallelism with each by a preselected angular amount for traversing movement of the watercraft in a direction changeable by movement of said control element in said second degree of freedom, said transmitters each comprising first and second members which are movable rotatably relative to one another to direct the thrust of the corresponding steerable propeller, the single control element acting during its movement in both its degrees of freedom onto said first members of the transmitters of both propellers but through independent mechanical motion transfer modes defining said first and second paths of actuation.

4,418,634

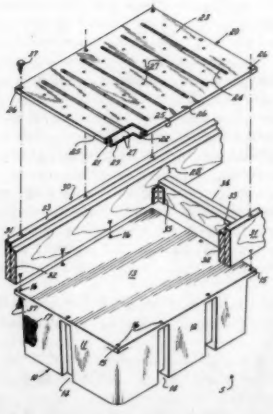
MARINE FLOAT

Leo H. Gerbus, 824 Kingfisher Dr., Cincinnati, Ohio 45202

Filed Oct. 23, 1981, Ser. No. 314,369

Int. Cl.³ B63B *35/38*

U.S. Cl. 114—263 **5 Claims**



1. A marine float structure comprising a one piece, molded hollow, buoyant, rectangular box-shaped float unit of high strength, durable polymeric material, said float unit having end, side, top and bottom walls, the top wall of which is

flanged at a 90° angle at least at one point with respect to each side and end wall; a one piece, molded hollow, buoyant, rectangular box-shaped deck unit of high strength, durable polymeric material, said deck unit having end, side, top and bottom walls, the dimensions of which are essentially the same as those of the float unit except that the height of said side walls is substantially less than that of the float unit, the top wall of the deck unit being flanged at a 90° angle to the side and end walls thereof; a framework of connecting members sandwiched between the flanges of the float and deck units; and means connecting the float and deck units to the framework connecting members.

4,418,635

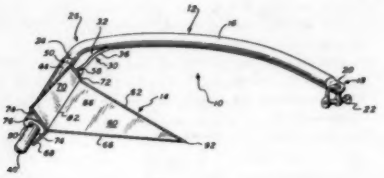
SINGLE-FLUKE ANCHOR

James M. Taylor, Box 4216, West Palm Beach, Fla. 33402

Continuation-in-part of Ser. No. 25,335, Mar. 30, 1979, abandoned. This application Jul. 6, 1981, Ser. No. 280,484

Int. Cl.³ B63B *21/40*

U.S. Cl. 114—304 **30 Claims**



1. An anchor of the type intended to be connected by a cable to a craft so as to be engaged in a bed and thereby to releasably moor a craft, said anchor comprising:

(a) a shank, the shank having a major leg and a shorter leg, the major leg having a forward and a rearward end, the legs being angularly joined at a juncture located at the rearward end of the major leg;

(b) the shank having a connection means, the shank being engaged by the cable at the forward end of the major leg by the connection means;

(c) a fluke pivotally secured for pivotal movement about an axis extending along said shorter leg, said fluke being pivotal with respect to said shank so as to be capable of moving said rearward end upward with respect to said bed, and at least a part of said fluke being engageable with the bed thereby causing force which is applied by the cable to the connection means to be transferred to the fluke;

(d) a part of the shank at said forward end curving away from the fluke so that it extends in a plane defined by the major and shorter legs, and extends away from the fluke, and said part being substantially prevented from pivoting about the shorter leg axis by said cable, causing said shank to pivot with said fluke in at least one plane about said part so as to substantially be capable, in response to the cable pulling upon the forward end, of moving in an oscillatory path in said one plane to thereby cause the fluke to more readily enter the bed.

4,418,636

POSITION INDICATOR FOR A TRUCK BODY

Harlow H. Piper, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/01198, § 371 Date Sep. 8, 1981, § 102(e) Date Sep. 8, 1981, PCT Pub. No. WO83/00848, PCT Pub. Date Mar. 17, 1983

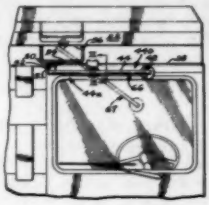
PCT Filed Sep. 8, 1981, Ser. No. 305,742

Int. Cl.³ B60Q *11/00*; B60P *1/28*

U.S. Cl. 116—28 R **9 Claims**

1. An indicating apparatus (24) for use in a vehicle (10) having a frame (12) and a body (14) pivotally mounted on the frame (12) and being movable between a lowered position and an elevated position (17,18) with respect to the frame (12), comprising:

means (44,48,50) positioned between said frame (12) and body (14) for mechanically indicating the positioning of said body, said positioning means including an indicator



member (44) adapted to be pivotally connected to the frame (12) and being biased for movement from a visually obscured position to a position that is visible from within said vehicle in response to the elevation of said body from said frame so as (14) to indicate the positioning of said body (14) in said elevated position (18).

4,418,637

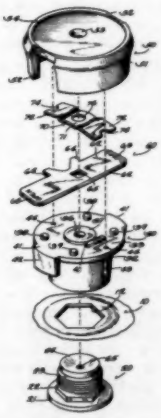
AUDIBLE SIGNAL VALVE KNOB

Thomas W. Heermans, West Bend, Wis., assignor to Regal Ware, Inc., Kewaskum, Wis.

Filed Apr. 21, 1981, Ser. No. 256,208

Int. Cl.³ G01L *19/12*; A47J *27/52*

U.S. Cl. 116—70 **15 Claims**



1. In a knob for a cooking vessel, a knob base projecting through the vessel and provided with a first whistle orifice and a surrounding lower resonance chamber portion; an outer knob abutting the vessel, removably secured to said knob base, and disposed outside the vessel, said outer knob comprising a resonance chamber upper wall having a second orifice therein, said lower resonance chamber portion and upper resonance resonance chamber wall defining a resonance chamber between them; a path area defined by abutments on the top of said outer knob, between which valve slide means slides, said path area crossing said second orifice; said valve slide means having abutments projecting from one side thereof, said projecting abutments limiting the travel of said valve slide means with respect to said abutments on the top of said outer knob; said

valve slide means having first and second positions in said path area and being provided with a third orifice aligned with said second whistle orifice when said slide is in said first position and non-aligned therewith when said slide is in said second position; a knob cover removably secured to said outer knob and having a fourth orifice communicating with said third orifice; and a separate biasing means positioned between said valve slide means and knob cover to urge said valve slide means into good contact with a circular boss disposed on a valve supporting surface of said outer knob and surrounding said second whistle orifice.

4,418,638

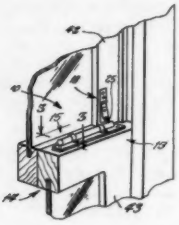
WINDOW-DOOR ALARM

Michel Lesly, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Dec. 10, 1979, Ser. No. 102,020

Int. Cl.³ F41F *27/00*; G08B *13/08*

U.S. Cl. 116—87 **1 Claim**



1. A protection device for a movable closure comprising in combination a firing mechanism unit mounted on said closure, a triggering unit for activating said firing mechanism unit mounted on a fixed member and a gun-powder loaded firing cap wherein, said firing mechanism unit comprises a barrel containing a compression coil spring bearing against a closed end of said barrel and a hammer slidably mounted in said barrel, said cap being squeezed into an open end of said barrel, said spring bearing against a rear end of said hammer urging said hammer toward said cap including a sideward pin extending from said hammer slidable in a slot along a side of said barrel parallel to the barrel axis wherein said triggering unit comprises a fixed plate secured to said fixed member said plate having means retaining said pin in a cocked position compressing said spring when the closure is closed, whereby said means is adapted to release said pin when the closure is moved towards an open position thus permitting the pin to slide in said slot wherein said means comprises a retainer plate pivotally secured to said fixed plate having a retaining slot for receiving said pin, whereby said pin pivotably slidable from a transverse extension of the barrel slot retaining said pin in cocked position, to a released position aligned with the barrel slot, whereby movement of said closure member towards an open position causes the pin to pivot to said released position.

4,418,639

APPARATUS FOR TREATING SEMICONDUCTOR WAFERS

James C. Wills, Los Altos, and Douglas S. Spenser, Santa Clara, both of Calif., assignors to Solitec, Inc., Santa Clara, Calif.

Filed May 19, 1981, Ser. No. 265,185

Int. Cl.³ B05C *11/02, 13/02*

U.S. Cl. 118—50 **1 Claim**

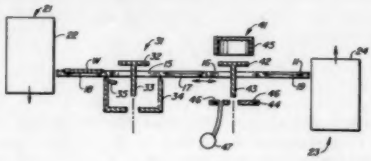
1. Apparatus for treating semiconductor wafers comprising a reciprocating wafer tray having

at least three wafer carrying apertures, at least a pair of operating apertures each one located inbetween a different adjacent pair of said three wafer carrying apertures, and

slots in the tray providing open access between at least certain of operating and carrying apertures;

means for reciprocating said tray back and forth between an input loading station and an output unloading station;

at least first and second treating stations inbetween said loading and unloading stations, each treating station having



a wafer chuck vertically reciprocal through said operating apertures in said tray;

said first treating station having means for applying photoresist to a wafer; and

said second treating station having means for evacuating the space surrounding a wafer with applied photoresist and simultaneously conducting heat to the wafer from the wafer chuck.

4,418,640

APPLICATOR FOR APPLYING ADHESIVE TO A WORK PIECE

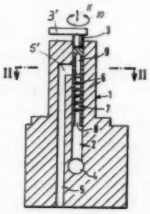
Alfred Dettelbach, Stuttgart, and Roland Henzler, Nuertingen-Raidwangen, both of Fed. Rep. of Germany, assignors to Reich Spezialmaschinen GmbH, Nuertingen, Fed. Rep. of Germany

Filed Apr. 6, 1982, Ser. No. 366,051

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115418

Int. Cl.³ B05C *5/02*

U.S. Cl. 118—411 **6 Claims**



1. An applicator for applying adhesive to work pieces, especially in an edge gluing machine through which the work pieces travel, comprising an upright nozzle body (1) having an upper end and a lower end, adhesive supply conduit means (2, 4) entering into said nozzle body (1) at its lower end and extending toward its upper end, adhesive discharge hole means (6) connecting said supply conduit means to an external adhesive applicator surface (1') intermediate the lower and upper ends of the nozzle body (1), slide valve means (3) slidably inserted in at least a portion of said supply conduit means (2) for opening said adhesive discharge hole means (6) to a desired extent in different positions of the slide valve means (3) and for closing said adhesive discharge hole means (6) in a further position of said slide valve means (3) which is operable from the outside of said nozzle body (1), and scavenging duct means (5, 5') operatively connected to said adhesive supply conduit means above said adhesive discharge hole means (6) in said nozzle body (1) for collecting contaminants above said adhe-

sive discharge hole means (6) when said slide valve means separates said scavenging duct means from said supply conduit means, said slide valve means (3) having an opening (9) above said adhesive discharge hole means (6) for connecting said scavenging duct means (5, 5') to said supply conduit means (2, 4) when said slide valve means is in a third position for discharging from said supply conduit means a quantity of adhesive with contaminants collected therein into said scavenging duct means above said adhesive discharge hole means (6).

4,418,641

DIP-COATING APPARATUS

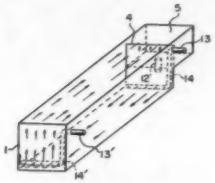
Atushi Nakashima; Michisuke Edamatu, and Kenji Kushi, all of Ohtake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Division of Ser. No. 163,360, Jun. 26, 1980, Pat. No. 4,353,934. This application Apr. 5, 1982, Ser. No. 365,761

Claims priority, application Japan, Jul. 9, 1979, 54-86722; Jul. 10, 1979, 54-87232

Int. Cl.³ B05C *3/00*

U.S. Cl. 118—429 **6 Claims**



1. A dip-coating apparatus for obtaining a coated film on the surface of an article by dipping the article in a coating solution in a tank in which a coating solution is circulated and the article is pulled up out of the solution, characterized in that an ultrasonic wave oscillator is provided and a nozzle which can jet the coating solution uniformly and parallelly with the bottom of the solution tank from the side on which the coating solution overflows toward the side opposite it is provided at the bottom of the coating solution tank.

4,418,642

BUILD CONTROL APPARATUS AND METHOD

Donald J. Gillette, Guilford, and Bedrich Hajek, New Haven, both of Conn., assignors to Electrostatic Equipment Corporation, New Haven, Conn.

Filed Nov. 20, 1981, Ser. No. 302,200

Int. Cl.³ B05D *1/06*

U.S. Cl. 118—624 **15 Claims**

1. Adjustable build control means for electrostatic cloud coating apparatus, comprising a pair of fixtures, each fixture having an opening therein to permit passage of a workpiece therethrough and an engagement portion extending at least partially about said opening of said fixture; at least one build control member; and means for securing said build control member to said engagement portions of said fixtures to extend therebetween, said engagement portions being so configured as to permit variation of the angular relationship of all parts of said build control member to the workpiece by movement of said build control members angularly as a unit to any of a multiplicity of positions about said openings thereof, said fixtures being adapted for mounting at spaced locations in the coating apparatus, with said openings thereof in axial alignment to define a workpiece travel path therethrough, whereby said build control member can be disposed in any of a multiplicity of angularly displaced positions about the axis of said travel path.

4,418,643

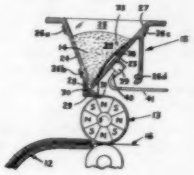
FEED HOPPER ASSEMBLY FOR PARTICULATE MATERIAL AND PRINTER

Robert M. Barto, Jr., Wyckoff, N.J., and Ira Lopata, New York, N.Y., assignors to Ragen Precision Industries, Inc., North Arlington, N.J.

Continuation of Ser. No. 289,760, Aug. 3, 1981, abandoned. This application Nov. 22, 1982, Ser. No. 443,634

Int. Cl.³ G03G *15/09*

U.S. Cl. 118—657 **4 Claims**



1. A feed hopper assembly for particulate material comprising:

a. wall means including spaced and converging side walls each respectively having an inner surface and an outer surface, and spaced end walls at opposite ends of said wall to define therewith a storage chamber having an upper opening for charging particulate material therein,

b. one of said converging side walls having a length longer than that of the other shorter converging side wall,

c. said longer converging side wall having, a shelf means formed at the lower end disposed to extend transversely through and in relatively close proximity below the other shorter side wall to form therewith a sized discharged outlet means,

d. flexible diaphragm means connected to the inner face of at least one of said converging side walls to form an expansible chamber disposed for operative communication with the particulate material charged into the storage chamber formed in the feed hopper,

e. pneumatic pulsating means connected to the outer face of said one side wall having the flexible diaphragm means connected to the inner face thereof including, means in the side wall forming an air passage therethrough communicating at one end with the expansible chamber, a pumping means for pumping air, conduit means connected at one end to the air inlet means and at the opposite end to said pumping means for delivering and removing air to and from said expansible chamber for expanding and deflating the flexible diaphragm means, and means for driving the pumping means for intermittently expanding the flexible diaphragm means to undulate the particulate material charged into the storage chamber and to cause the same to flow directly and freely through said discharge outlet means to said shelf means, and

f. bleed means connected in said pneumatic pulsating means for bleeding air from the pneumatic pulsating means above a predetermined pressure.

3. In an electrostatic printer having a rotatable magnetic toning roller for delivering electrostatic/magnetic toner for the printing cycle therein, rotatable pressure fusing rollers, means for driving the magnetic toning roller, and means for driving the rotatable pressure fusing rollers, the combination with said rotatable magnetic toning roller of, a feed hopper assembly comprising:

a. wall means including spaced and converging side walls each respectively having an inner surface and an outer surface, and spaced end walls at opposite ends of said wall to define therewith a storage chamber having an upper opening for charging particulate material therein,

b. one of said converting side walls having a length longer than that of the other shorter converging side wall,

c. said longer converging side wall having, a shelf means formed at the lower end disposed to extend tranversely through and in relatively close proximity below the other shorter side wall to form therewith a sized discharged outlet means,

d. flexible diaphragm means connected to the inner face of at least one of said converging side walls to form an expansible chamber disposed for operative communication with the particulate material charged into the storage chamber formed in the feed hopper,

e. pneumatic pulsating means connected to the outer face of said one side wall having the flexible diaphragm means connected to the inner face thereof including, means in the side wall forming an air passage therethrough communicating at one end with the expansible chamber, a pumping means for pumping air, conduit means connected at one end to the air inlet means and at the opposite end to said pumping means for delivering and removing air to and from said expansible chamber for expanding and deflating the flexible diaphragm means, and means for driving the pumping means for intermittently expanding the flexible diaphragm means to undulate the particulate material charged into the storage chamber and to cause the same to flow directly and freely through said discharge outlet means to said shelf means, and

f. bleed means connected in said pneumatic pulsating means for bleeding air from the pneumatic pulsating means above a predetermined pressure,

g. said shelf means operatively associated with the magnetic toning roller to deliver the metered amount of particulate material discharged thereon when the magnetic toning roller is rotated, and

h. the means for driving the pressure fusion rollers operatively connected to said pump means for synchronous and intermittent operation thereof to enable the delivery of air to the flexible diaphragm means in accordance with the operation of the electrostatic printer.

4,418,644

OBJECT PROCESSING APPARATUS

Jerry W. Young, Weston, Mo., assignor to Sealright Co. Inc., Kansas City, Mich.

Continuation of Ser. No. 924,331, Jul. 13, 1978, abandoned. This application Dec. 1, 1980, Ser. No. 211,870

Int. Cl.³ B05C *7/02*

U.S. Cl. 118—669 **20 Claims**

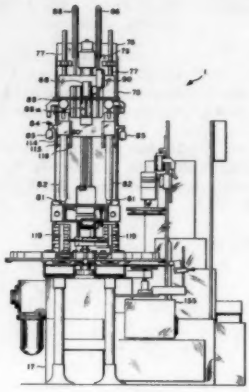
9. A container processing apparatus including:

first motor means operable for rotating the container;

first counter means for counting pulse signals;

first detecting means positioned adjacent said first motor means, said first detecting means being operably connected to said first counter means and operable for providing to the first counter means a first enabling signal representative of a rotational position of the container as the container is rotated by said first motor means;

encoder means operably connected to the first motor means and to said first counter means, said encoder means being operable for providing a plurality of pulse signals, each pulse signal being representative of an increment of rotation of the container by said first motor means, said first counter means being activated by the enabling signal to start counting the pulse signals, and said first counter means being operable for deenergizing the first motor means for forward rotation of the container after counting a first predetermined number of pulse signals so that the container decelerates to a nonrotating condition at a predetermined rotational position;



first sealant dispensing means; and

sealant dispensing control means operably connected to said first sealant dispensing means and operable for controlling the operation of the first sealant dispensing means for applying sealant to a selected area of the container while the container is oriented by said predetermined rotational position.

4,418,645

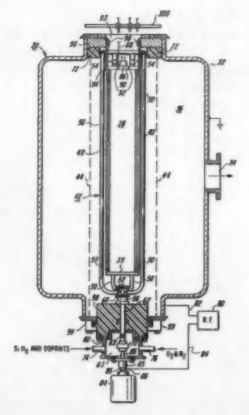
GLOW DISCHARGE APPARATUS WITH SQUIRREL CAGE ELECTRODE

John C. Knights, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1982, Ser. No. 362,343

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—715 **6 Claims**

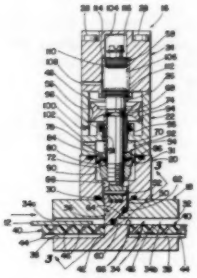


1. In an r.f. glow discharge system, the combination comprising:

a plurality of elongated hollow electrodes positioned cir-

cumferentially about a central point forming a circular array, said array coupled to one lead of an r.f. source,
means to supply reactant gases to the interior of said hollow electrodes,
mounting means for supporting a workpiece within the confines of said electrode circular array,
a second electrode exterior of said electrode circular array and coupled to the other lead of said r.f. source,
means to provide relative rotational movement between said electrode array and said mounting means, and
a plurality of apertures along the length of said array electrodes and aligned toward the surface of said workpiece for the exposure of said reactant gases toward a mounted workpiece.

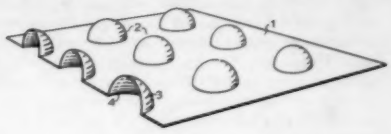
4,418,646
LOAD LOCK VALVE
John Zajac, San Jose, Calif., assignor to Eaton Corporation, Cleveland, Ohio
Filed Mar. 29, 1982, Ser. No. 362,929
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—733 **10 Claims**



1. In apparatus for processing semiconductor wafers including a first chamber operable at a first pressure, a second chamber operable at a second pressure, and a conduit for the passage of semiconductor wafers from said first chamber to said second chamber; a valve operable to selectively open and close said conduit comprising a base; a first passage formed through said base defining a portion of said conduit; a seat surface formed on a wall of said first passage over which said wafers pass; a second passage substantially perpendicular to and intersecting said first passage; a valve element received in said second passage and movable between a first position closing said first passage and a second position opening said first passage, said valve element having a seal element thereon having a first sealing surface engageable with said seat surface and a second sealing surface engageable with a wall of said substantially perpendicular second passage when said valve element is in its first position; and actuating means operable to move said valve element between said first and second positions.

4,418,647
ARTIFICIAL HOST EGG FOR REARING TRICHOGRAMMA
Jarett D. Hoffman, Columbia, Mo., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed May 20, 1982, Ser. No. 380,375
Int. Cl.³ A01K *67/00*
U.S. Cl. 119—1 **9 Claims**

1. A substrate for use in the in vitro rearing of Trichogramma wasps and adapted for oviposition therein by mature females, said substrate comprising an artificial membrane having an outer surface and an inner surface and at least one curvilinear surface region extending through an arc of at least about 90°, said region being convex on the outer surface of said membrane and concave on the inner surface of said membrane, wherein the membrane in said region is characterized by a thickness, curvature, and outer surface texture suitable to

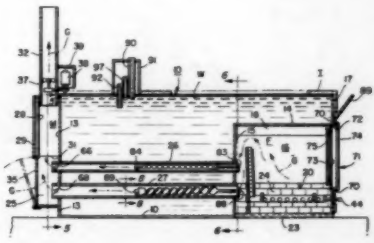


induce oviposition by said females, and wherein the membrane on the inner surface of said region defines a semienclosed cavity.

4,418,648
PROCESS FOR THE REDUCTION OF GILL DISEASE IN SHRIMP
Donald V. Lightner, Tucson, Ariz., assignor to Marine Culture Enterprises, Atlanta, Ga.
Continuation of Ser. No. 31,555, Apr. 19, 1979, abandoned. This application Sep. 25, 1981, Ser. No. 305,434
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—2 **7 Claims**

2. A process for reducing gill disease in shrimp in controlled environment aquaculture comprising introducing into the water constituting said environment a source of permanganate ion in sufficient quantity to yield a permanganate ion concentration in the water of from about 1 p.p.m. to about 10 p.p.m., and a sufficient amount of triethanolamine copper (II) to provide a CU (II) concentration in the water of from about 0.1 p.p.m. to about 5.0 p.p.m.

4,418,649
BOILER STRUCTURE
James E. Purvis, Rte. 2, P.O. Box 374, Adel, Ga. 31620
Filed Nov. 2, 1982, Ser. No. 438,435
Int. Cl.³ F22B *5/00*
U.S. Cl. 122—15 **18 Claims**



1. An improved boiler for burning fuel to heat water, comprising:
(a) a horizontal water tank having a rear bulkhead at its rear end, having a second bulkhead which is recessed in the tank spaced from its front end to form a fire box, the second bulkhead extending partway up the height of the tank to leave a top portion of the tank overhanging said fire box and closed by a horizontal plate, the tank having spaced opposed side portions extending on both sides of the fire box from the second bulkhead to the front of the tank, the side and top portions of the tank being substantially water filled and communicating with the water in the tank, and the tank having multiple horizontal flue tubes extending longitudinally through the tank below its center and through the bulkheads and sealed thereto;

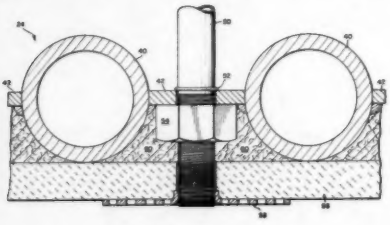
(b) a hollow water filled grate in the fire box located between the tank side portions and below its top portion, and means to circulate water from the tank through the grate;
(c) a front partition extending down from said top portion and transversely between said side portions and closing the front of the tank and the fire box, said front partition having doors located between said side portions and disposed for access to the fire box to load fuel on said grate, the doors being water filled and having means to circulate water from the tank through the doors, and the front partition having ash clean-out doors located below said grate;
(d) a gas manifold chamber enclosing said rear bulkhead of the tank and having a smoke stack extending therethrough above the tank; and
(e) an upright baffle extending transversely across the fire box and located between the grate and the second bulkhead and extending from the bottom of the fire box above the grate to a level higher than the level of the highest flue tube but below the level of said horizontal plate, whereby hot gases from the fire box will collect and mix near the level of the plate in front of the baffle before being drawn downwardly again to enter the flue tubes to the rear of the baffle.

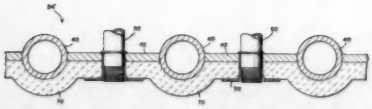
4,418,650

FLUIDIZED BED HEAT EXCHANGER HAVING AN INSULATED FLUID COOLED AIR DISTRIBUTOR PLATE ASSEMBLY

Richard C. Johnson, Dansville, N.Y.; Venkatraman Seshamani, Gillette, N.J., and Leigh B. Egbert, Dansville, N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Sep. 20, 1982, Ser. No. 420,445
Int. Cl.³ F22B *1/00*; F28D *13/00*
U.S. Cl. 122—4 D **15 Claims**





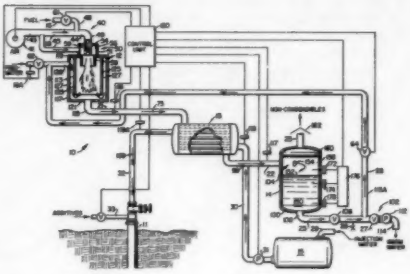
1. A fluidized bed heat exchanger comprising a plate assembly including a plurality of spaced parallel horizontal tubes, said plate assembly extending in a substantially horizontal plate to support a bed of particulate material, means for passing a cooling fluid through said tubes, a plurality of openings formed through said plate assembly, an air plenum located below said plate assembly for introducing heated air into said openings, said air passing through said openings to fluidize said particulate material, and means for insulating the lower surface of said plate assembly from the heat of said air.

4,418,651

SYSTEM FOR HEATING AND UTILIZING FLUIDS

William G. Wyatt, Arlington, Tex., assignor to Vapor Energy, Inc., Grand Prairie, Tex.

Filed Jul. 2, 1982, Ser. No. 394,721
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—31 R **26 Claims**



1. A hot water supply system utilizing a combustion of fuel and air and the mixture of water, steam and non-combustibles to provide resultant hot water at a select temperature, said system comprising:
a vapor generator of the type having a chamber for the receipt and combustion of a fuel-air mixture;
a means for supplying feedwater to said chamber for the conversion of said feedwater, fuel and air to lower pressure steam and non-condensibles therein;
means for conveying said low pressure steam and non-condensibles away from said vapor generator;
pump means for delivering a stream of relatively cool water at high pressure from a source thereof;
a heat exchanger for effecting heat exchange between said low pressure stream of steam and non-condensibles and said stream of cool high pressure water to heat the water stream to a desired temperature without substantially reducing the pressure thereon, while condensing at least some of the steam from said stream of steam and non-condensibles;
means for sensing the temperature of said resultant heated water and producing an output signal in response thereto; and
control means for detecting the output of said sensing means and controlling the flow of said feedwater and high pressure cool water for regulating the flow and temperature of said resultant high pressure heated water.

4,418,652

STEAM GENERATOR HAVING A SUPERHEATER TUBE BANK

Karl Rees, Ruti, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

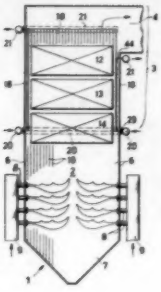
Filed Aug. 17, 1982, Ser. No. 408,926
Claims priority, application Switzerland, Sep. 15, 1981, 5943/81
Int. Cl.³ F22G *3/00*
U.S. Cl. 122—468 **13 Claims**

1. In a steam generator, the combination comprising
a combustion chamber having at least two walls of evaporator tubes;
a gas flue above and in communication with said combustion chamber, said flue having at least two walls, each said wall including a plurality of evaporator tubes and webs securing said tubes together in seal-tight manner;
a plurality of forked connectors at a lower end of said flue, each connector connecting a respective pair of adjacent

evaporator tubes of said combustion chamber walls to a respective evaporator tube of said gas flue walls;

a bank of vertical superheater tubes disposed in said gas flue over said evaporator tubes; and

a plurality of forked elements at a lower end of said bank of



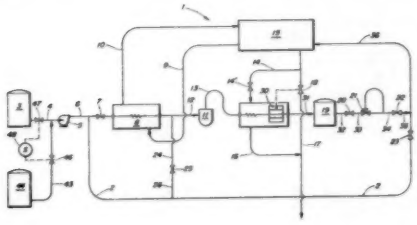
said superheater tubes, each said forked element having a bend extending through a respective web between an adjacent pair of said evaporator tubes of said gas flue walls and being connected respectively to a pair of said superheater tubes to distribute a working medium therebetween.

4,418,653

ALCOHOL FUEL DUAL-CATALYST TREATMENT APPARATUS AND METHOD

Heeyoung Yoon, McMurray, Pa., assignor to Conoco Inc., Wilmington, Del.

Filed Jun. 7, 1982, Ser. No. 385,747
Int. Cl.³ F02M *27/02*
U.S. Cl. 123—3 **5 Claims**



1. A fuel treatment and distribution apparatus in combination comprising:

an internal combustion engine

an alcohol fuel storage tank,

a vaporizer means,

a dual catalyst containing reactor means, said catalyst containing reactor comprising a dehydrated catalyst means and a dissociation catalyst means,

said dehydration catalyst being active in the catalysis of methanol to form dimethyl ether and water,

said dissociation catalyst being active in the catalysis of methanol to form carbon monoxide and hydrogen,

said alcohol storage tank being in fluid flow communication with said vaporizer means,

said vaporizer being in fluid flow communication with said dual catalyst containing reactor means, so that alcohol vapor from said vaporizer means first passes through said dehydration catalyst means and then passes through said dissociation catalyst means,

said catalyst containing reactor means being in fluid flow communication with said internal combustion engine, whereby at least a portion of the alcohol from said alcohol storage tank is dehydrated to form water and an ether in said dehydration catalyst means and at least a portion of said alcohol is dissociated to H_2 and CO in said dissociation catalyst means and at least a portion of said water and said CO reacts to form CO_2 and H_2 prior to being passed to said engine.

5. A method of operating an internal combustion engine comprising in sequence the steps as follows:

(a) providing a dual catalyst reactor means having a dehydration catalyst and dissociation catalyst

said dehydration catalyst being active in the catalysis of methanol to form dimethyl ether and water,

said dissociation catalyst being active in the catalysis of methanol to form carbon monoxide and hydrogen,

(b) providing methanol,

(c) vaporing said methanol to form methanol vapor,

(d) dehydrating a portion of said feed methanol vapor over said dehydration catalyst in a first portion of said reactor means to form dimethyl ether, water and a portion of the hydrogen of a first portion gaseous mixture and dissociating at least a portion of said methanol vapor over said dissociation catalyst in said first portion of said reactor means, to form carbon monoxide and a portion of the hydrogen of said first portion gaseous mixture said first portion gaseous mixture comprising hydrogen, water, carbon monoxide, dimethyl ether and residual methanol,

(e) dissociating at least a portion of said residual methanol in a second portion of said reactor means to form carbon monoxide and a portion of the hydrogen of a second portion gaseous mixture,

(f) forming a portion of the hydrogen of said second portion gaseous mixture by reaction of said water formed in said first reactor portion with carbon monoxide,

to form said second portion gaseous mixture comprising hydrogen,

said second portion gaseous mixture being formed in the presence of said first portion gaseous mixture whereby a combustion feed gaseous mixture comprising hydrogen and dimethyl ether is formed,

(g) conveying said combustion feed gaseous mixture to said internal combustion engine,

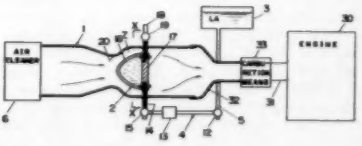
whereby said engine is operated by combustion of said combustion feed gaseous mixture with air.

4,418,654

FUEL SUPPLEMENT SUPPLYING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Kodo Keiun, 1-9, 4-chome, Sakuragaoka, Minoo, Osaka, 562, Japan

Filed May 27, 1982, Ser. No. 382,640
Claims priority, application Japan, May 27, 1981, 56-80294
Int. Cl.³ F02M *25/02*
U.S. Cl. 123—25 A **7 Claims**



1. A fuel supplement supplying device for an internal combustion engine to add a liquid additive into the air being introduced prior to be mixed with fuel comprising:

an induction duct open at its one end to the atmosphere and communicatively connected at its opposite end to the combustion chamber of the internal combustion engine;

a reservoir disposed outside of said induction duct and adapted to hold a volume of liquid additive such as water and methanol therein;

a hollow vaporizing head disposed within said induction duct upstream of the mixing area where a fuel is mixed with the air passing therethrough to define a constricted annular zone between the head and the induction duct; and

a feed line interconnecting the reservoir and the vaporizing head for feeding said liquid additive into the vaporizing head;

said vaporizing head having at least the wall of porous material extending across the entire periphery thereof and defining the contour of the head, said wall of porous material having per se a large number of minute spaced apart pores which are diffused substantially uniformly across the entire surface thereof and being exposed to said constricted annular zone over the substantially entire circumference of the head, and said reservoir being open to the atmosphere, whereby in response to a vacuum developed upon operation of the engine within the induction duct such liquid additive is fed from the reservoir to said head from where the same is sucked out through the pores of the wall into the stream of the air passing through said annular zone toward said mixing area and is vaporized in said air.

4,418,655

CYLINDER HEAD FOR AIR-COMPRESSING, SELF-IGNITING INJECTION INTERNAL COMBUSTION ENGINE

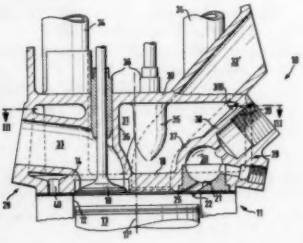
Richard Henning, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 2, 1982, Ser. No. 365,042

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1981, 3113308

Int. Cl.³ F02F *1/38, 1/42*

U.S. Cl. 123—41.82 R **9 Claims**



1. A cylinder head for an air-compressing, self-igniting injection internal combustion engine comprising

a substantially plate-shaped cylinder head bottom with adjoining walls of gas exchange ducts of a secondary combustion chamber separated from each other on a coolant side and exhibiting on the combustion chamber side sealing seats for valves, arranged approximately in a common plane, in the orifices of the gas exchange ducts, and wherein the secondary combustion chamber comprises a combustion port of a smaller cross-section as compared with the chamber cross-section and the combustion port is oriented approximately centrally toward a relatively wide main web extending between two inlet valves in the cylinder head bottom,

an outlet valve arranged in the cylinder head bottom essentially diametrically opposite to an orifice of a single combustion port of the secondary combustion chamber,

wherein the two inlet valves are arranged on respective sides of a first cylinder plane of symmetry and in an approximately contacting-to-overlapping fashion in regard to a second cylinder plane of symmetry located perpendicularly to the first, and

wherein the outlet valve and the orifice of the combustion port of the secondary combustion chamber on the cylinder side are arranged centrally in the first cylinder plane of symmetry, respectively close to the periphery of a cylinder projection

whereby a substantially even temperature distribution in the cylinder head bottom is achieved.

4,418,656

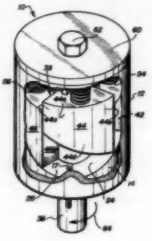
ROTARY MOTION TRANSFORMER

Austin N. Stanton, 4240 Briar Creek La., Dallas, Tex. 75214

Continuation of Ser. No. 126,893, Mar. 3, 1980, abandoned. This application Aug. 24, 1982, Ser. No. 410,966

Int. Cl.³ F02B *75/26*

U.S. Cl. 123—58 AM **21 Claims**



1. A rotary motion transformer, comprising:

a housing;

a shaft extending coaxially within said housing and rotatable relative thereto;

a set of n pistons where n is an even number, each piston having an outer surface mating with the interior surface of said housing and an inner surface mating with said shaft;

an annular cam at one end of said housing, said cam having n helicoid surfaces facing said pistons, said surfaces alternating ascending and descending to form n/2 lobes on said cam;

a helicoid surface on the end of each of said pistons facing said cam, said piston helicoid surfaces mating with alternate ones of said helicoid surfaces on said cam, said pistons rotatable relative to said cam; and

port means extending to within said housing for providing fluid communications with said transformer.

4,418,657

SPLIT CYCLE INTERNAL COMBUSTION ENGINES

John D. Wishart, P.O. Box 171, Blackburn, Victoria, 3130, Australia

PCT No. PCT/AU81/00159, § 371 Date Jun. 11, 1982, § 102(e) Date Jun. 11, 1982, PCT Pub. No. WO82/01741, PCT Pub. Date May 27, 1982

PCT Filed Nov. 6, 1981, Ser. No. 395,087

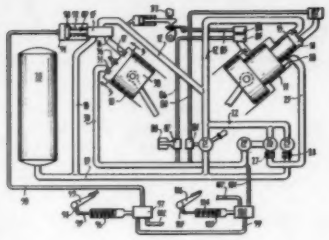
Claims priority, application Australia, Nov. 13, 1980, PE6471; Apr. 5, 1981, PE8689

Int. Cl.³ F02B *1/08, 33/00, 75/00*

U.S. Cl. 123—68 **4 Claims**

1. A spark ignition internal combustion engine comprising a firing cylinder and a compression cylinder having reciprocating therein respectively a power piston and a compression piston connected to a common crankshaft, a combustion chamber defined by the firing cylinder head, at least one recess containing valve heads and spark plug electrodes, and the crown of the moving power piston characterised by means directing into the combustion chamber in advance of the spark as the power piston approaches or reaches top dead centre a

pilot charge composed of spark-ignitable fuel mixed with compressed air from the compression cylinder at a pressure below 2000 kPa, means producing a spark across the electrodes at or near top dead centre, and means directing into the combustion



chamber after the spark and while the piston is moving away from the cylinder head on the first part of the power stroke a second charge composed of fuel and compressed air from the compression cylinder at a pressure greater than 2000 kPa.

4,418,658

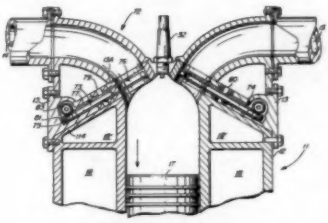
ENGINE VALVE

James DiRoss, 8002 E. Hubbell St., Scottsdale, Ariz. 85257

Continuation-in-part of Ser. No. 166,142, Jul. 7, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 420,015

Int. Cl.³ F01L *7/06*

U.S. Cl. 123—80 D **4 Claims**



1. A pressure generating device comprising in combination:
a dome-shaped block,
said block defining a cylinder having input and exhaust ports,
a piston reciprocally mounted in said cylinder,
at least one circular flat rotary valve having flat surfaces on opposite sides thereof and a port extending therethrough for controlling one of said input and exhaust ports,
said rotary valve being mounted on said block for rotation on an outside surface thereof for controlling the associated port,
said block defining a wear surface around the port against which said valve temporarily seats during each cycle of the pressure generating device,
one of the flat surfaces of said valve being provided with a rack of gear teeth on that surface around its periphery at a point near its edge,
a drive gear for meshing engagement with said rack of gear teeth,
means for rotating said drive gear in a timed sequence for controlling the operation of said piston; and
a cooling chamber formed in said block immediately below said outside surface of said block on which said valve rotates for cooling said valve,
said cooling chamber extending over at least one-half of said outside surface of said block on which said valve rotates.

4,418,659

PROCESS FOR PREVENTING THE PUMPING OF A HYDRAULIC VALVE CLEARANCE COMPENSATING ELEMENT IN VALVE OPERATING MECHANISMS OR INTERNAL COMBUSTION ENGINES

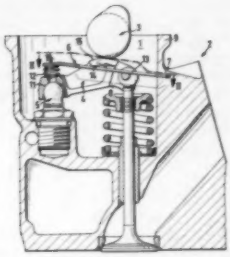
Georg Gaede, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Division of Ser. No. 100,026, Dec. 3, 1979, Pat. No. 4,359,019. This application Apr. 16, 1982, Ser. No. 369,029

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852293

Int. Cl.³ F01L *1/18, 1/24*

U.S. Cl. 123—90.46 **10 Claims**



1. In a valve operating mechanism of an internal combustion engine comprising
hydraulic valve clearance compensating means,
a valve actuating lever supported by said valve clearance compensating means in a bearing zone of said lever and cam means for controlling movement of the valve actuating lever, the improvement comprising
means acting upon said bearing zone of said lever for applying an auxiliary force in response to the movement of said cam means to said valve clearance compensating means only during a valve lifting phase of said cam means,
said auxiliary force being greater than and directed to counteract a compensating force of said valve clearance compensating means and being independent of a bearing force of said valve actuating lever.

4,418,660

PLASMA IGNITION SYSTEM USING PHOTOTHYRISTORS FOR INTERNAL COMBUSTION ENGINE

Hiroshi Endo; Masazumi Sone; Iwao Imai, and Yasuki Ishikawa, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Apr. 7, 1982, Ser. No. 367,036

Claims priority, application Japan, Apr. 7, 1981, 56-51262

Int. Cl.³ F02P *1/00*

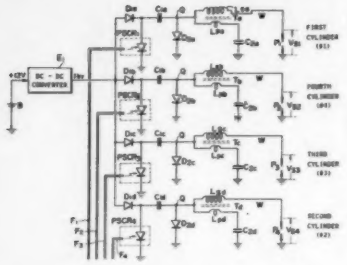
U.S. Cl. 123—143 B **6 Claims**

1. A plasma ignition system for an internal combustion engine having a plurality of cylinders, comprising:
(a) a plasma ignition plug located within each corresponding cylinder and having a central electrode and grounded side electrode;
(b) a DC-DC converter for boosting a low DC voltage supplied thereinto to a high DC voltage;
(c) a plurality of plasma ignition energy capacitors, each for charging the high DC voltage received from said DC-DC converter;
(d) a plurality of photo-sensitive switching elements, each connected between one terminal of each corresponding plasma ignition energy capacitor and ground which turns on to apply the plasma ignition energy charged within said corresponding plasma ignition energy capacitor to the

corresponding plasma ignition plug in response to a light trigger signal received thereat;

(e) a plurality of voltage-boosting transformers, each having a common terminal of primary and secondary windings connected to the other terminal of each corresponding plasma ignition energy capacitor and another terminal of the primary winding connected to said corresponding plasma ignition plug for boosting the voltage across the corresponding plasma ignition energy capacitor to a still higher voltage at the secondary winding thereof depending on the winding ratio between the primary and secondary windings;

(f) an auxiliary capacitor connected between another terminal of said secondary winding of each voltageboosting transformer and ground so as to form an oscillation circuit together with the primary winding of said corresponding voltage-boosting transformer;



(g) an ignition timing signal generator which produces and sequencially outputs an electrical ignition timing signal for each cylinder at a predetermined timing according to the engine revolution; and

(h) a plurality of light emitting elements, each connected to said ignition timing signal generator and which emits a light signal for triggering said corresponding photo-sensitive switching element to turn on in response to the electrical ignition timing signal from said ignition timing signal generator.

4,418,661
GLOW PLUG, PARTICULARLY FOR DIESEL ENGINE

Friedrich Esper, Leonberg; Thomas Frey, Rutesheim; Heinz Geier, Gerlingen; Gerhard Holfelder, Ditzingen, and Günther Knoll, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 27, 1981, Ser. No. 267,516

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104401

Int. Cl.³ F23G *7/00;* **F02P** *19/02*

U.S. Cl. 123—145 A **23 Claims**

1. Glow plug for preheating of gases, particularly for use in an internal combustion engine, having

a tubular metal holding plug (11) having an opening (12) therethrough;

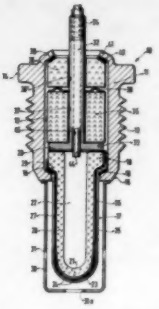
a ceramic tube (20, 20') secured with one end in the opening of the plug;

an electric heater means (24, 24') located on the surface of said ceramic tube;

and at least one connecting element (32) extending through the central opening of the plug and insulated therefrom; wherein

the ceramic tube has a closed bottom (21) at the other end thereof defining an enclosed hollow interior space (22) within the tube;

electrical heater current connection means (26, 27; 26', 27' are provided, extending from the region of the holding plug to the heater means (24, 24') and electrically connected thereto, and including an electrical connection to said connecting element (32);



and wherein said heater means (24, 24') is a layer or film of metal located on the tube essentially only in the region of said closed bottom (21).

4,418,662
ENGINE AIR INTAKE FILTER WITH FUMES-ABSORBING SUBSTANCE

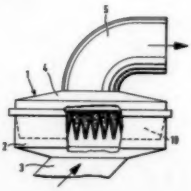
Walter Engler, Bietigheim-Bissingen; Hans Erdmannsdörfer, Ludwigsburg; Heinz Müller, Remseck, and Manfred Wagner, Stuttgart, all of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 282,158

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 8019041[U]

Int. Cl.³ B01D *50/00;* **F02M** *33/02*

U.S. Cl. 123—198 D **6 Claims**



1. An air intake filter for use with an internal combustion engine and designed to prevent the escape through the filter of fuel fumes when the engine is at standstill, the filter comprising in combination:

a closed filter housing assembly having a raw air inlet and a clean air outlet; and

a filter cartridge partitioning the interior of the filter housing assembly into a raw air space and a clean air space in such a way that the combustion air which flows through the filter is traversing the filter cartridge in a substantially vertical direction; wherein the filter cartridge comprises:

a block-shaped filter body of zigzag-folded filter paper having fold edges at the top and bottom of the filter body oriented within an angular range of 30° from a horizontal plane and defining generally wedge-shaped fold cavities upstream and downstream of the filter paper;

an air-permeable bed of a granular fuel-absorbant material filling the downstream fold cavities to a level at which the downstream fold edges are submerged a small distance in said bed;

an air permeable cover layer on the downstream side of the fuel-absorbant bed, the cover layer having air passages

which are smaller than the fuel-absorbant granules, thereby holding the latter in place; and

a sealing collar surrounding the filter body and the cover layer in the manner of a frame, the sealing collar serving to attach the cover layer to the filter body and to position the filter cartridge inside the filter housing assembly.

4,418,663

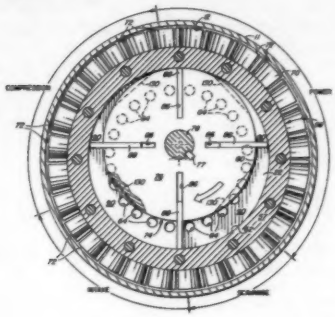
ROTARY ENGINE

Arthur P. Bentley, P.O. Box 1952, Roswell, N. Mex. 88201

Filed Dec. 21, 1981, Ser. No. 332,539

Int. Cl.³ F02B *53/00*

U.S. Cl. 123—243 **10 Claims**



1. A rotary internal combustion engine comprising:

(a) an engine housing including,

I. a main body portion having a bore which forms a rotation chamber,

II. an end plate mounted on one end of the main body portion for closing thereof, said end plate having a fuel inlet passage formed therethrough for receiving a fuel mixture from an external supply thereof and directing it into the rotation chamber, said end plate having an exhaust port formed therethrough through which spent exhaust gases exit said engine housing,

III. a fuel porting partition mounted at the opposite end of said main body portion and having a first plurality of fuel transfer ports formed therethrough which are disposed to lie in spaced increments on a circular centerline adjacent the periphery of said fuel porting partition and having a second plurality of fuel transfer ports formed therethrough which are disposed to lie in spaced increments about a circular centerline of reduced diameter,

IV. a support partition mounted on the opposite end of said main body portion with said fuel porting partition interposed therebetween, said support partition configured to provide a fuel induction chamber between said fuel porting partition and said support partition, said fuel induction chamber for receiving the fuel mixture from said rotation chamber through the first plurality of fuel transfer ports of said fuel porting partition and directing the received fuel mixture into said second plurality of fuel transfer ports of said fuel porting partition,

V. an end cover mounted on the opposite end of said main body portion with said fuel porting partition and said support partition interposed therebetween, said end cover configured to form a chamber between said support partition and said end cover;

(b) a rotor chamber casing having a rotor chamber therein, said rotor chamber casing journaled for rotation within the rotation chamber of said engine housing;

(c) a rotor assembly journaled for rotation about an axis which is eccentric with respect to the rotational axis of said rotor chamber casing, said rotor assembly including,

I. a rotor body positioned within the rotor chamber of said rotor chamber casing,

II. at least a spaced pair of radially reciprocal vanes mounted in said rotor body to form a combustion chamber therebetween,

III. an output shaft fast with said rotor body for rotation therewith and extending axially from said rotor body, said output shaft having an elongated power output end; and

(d) means connected between said rotor assembly and said rotor chamber casing for coupling combustion induced rotary motion of said rotor assembly to said rotor chamber casing so that said rotor chamber casing is driven at the same speed as said rotor assembly.

4,418,664

MODULAR PUMP-NOZZLE UNIT FOR AN INTERNAL COMBUSTION ENGINE

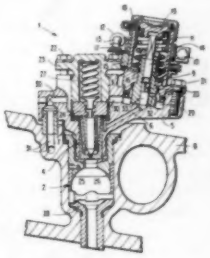
Walter Bellmann, Esslingen-Sulgries, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,904

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948407

Int. Cl.³ F02M *47/02*

U.S. Cl. 123—273 **14 Claims**



1. A pump-nozzle unit for internal combustion engines combined into one individual unit having a pump element with a pump piston, having an injection nozzle disposed next to said pump element, and having a basic unit serving as the support for the pump element and the injection nozzle, with said basic unit being firmly inserted in a recess disposed in the cylinder head, and having a spring housing located in the injection nozzle at the level of the pump piston, with said spring housing having a pressure spring interacting with a nozzle needle of the injection nozzle, characterized in that

the injection nozzle as a whole can be removed separately from the pump element from the basic unit remaining at the cylinder head.

4,418,665

METHOD OF AND APPARATUS FOR CONTROLLING THE AIR INTAKE OF AN INTERNAL COMBUSTION ENGINE

Masaomi Nagase, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 17, 1981, Ser. No. 303,108

Claims priority, application Japan, Sep. 24, 1980, 55-131461

Int. Cl.³ F02M *23/06*

U.S. Cl. 123—339 **10 Claims**

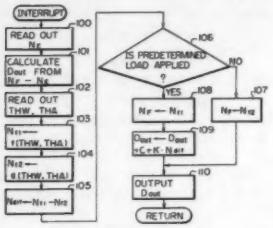
1. A method of controlling the air intake of an internal combustion engine having an intake passage, a throttle valve disposed in the intake passage, and an air bypass passage which interconnects the intake passage at a position located upstream

of the throttle valve with the intake passage at a position located downstream of the throttle valve, said method comprising the steps of:

monitoring whether at least one predetermined load is applied to the engine, to produce at least one load discrimination signal which indicates the monitored result;

detecting the actual rotational speed of the engine to produce a rotational speed signal which corresponds to the detected rotational speed;

comparing said produced rotational speed signal with a variable reference rotational speed signal which indicates a desired idling rotational speed of the engine, to generate a control output signal for adjusting the bypassed section of the air bypass passage, said desired idling rotational



speed being determined depending upon said load discrimination signal;

additionally changing, in response to said load discrimination signal, said control output signal by a value which corresponds to the difference between a first value related to a desired idling rotational speed when said predetermined load is applied to the engine and a second value related to a desired idling rotational speed when said predetermined load is not applied to the engine; and

adjusting, in response to the control output signal, the sectional area of said air bypass passage to control the flow rate of air drawn through said air bypass passage so as to reduce the difference between the actual rotational speed signal and the reference rotational speed signal.

4,418,666

DEVICE FOR CONTROLLING THE IDLING SPEED OF AN ENGINE

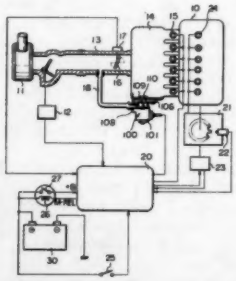
Yasutaka Yamauchi, Toyota, and Hiroshi Itou, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 22, 1982, Ser. No. 391,474

Claims priority, application Japan, Aug. 7, 1981, 56-124238

Int. Cl.³ F02B *33/00*; F02D *11/10*

U.S. Cl. 123—339 **7 Claims**



1. A device for controlling the idling speed of an engine comprising a main intake passage, a throttle valve arranged in the main intake passage, a bypass passage branching off from the main intake passage upstream of the throttle valve and being connected to the main intake passage downstream of the throttle valve, and a control valve arranged in the bypass passage, said device comprising:

a step motor actuating the control valve and having a plurality of step positions which are changed in accordance with the rotating motion of said step motor;

a plurality of memories each storing data which indicates the step position at which said step motor is positioned;

first means for comparing the step positions stored in said memories and determining the actual step position of said step motor;

second means for detecting the operating condition of the engine to produce an output signal indicating that the engine is idling; and

electronic control means operated in response to the output signal of said second means and producing a step motor drive signal for rotating said step motor until said actual step position becomes equal to a predetermined desired step position when the engine is idling.

4,418,667

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

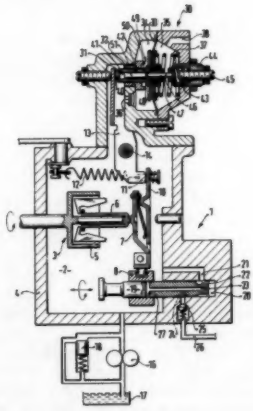
Ilija Djordjevic, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,215

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147220

Int. Cl.³ F02D *1/06*

U.S. Cl. 123—387 **3 Claims**



1. A fuel injection pump for an internal combustion engine, more specifically a distributor injection pump having a pump housing defining therewithin an inner chamber, said inner chamber comprising a suction chamber into which a feed pump supplies fuel at a speed dependent pressure, said injection pump further having a mechanical speed governor which acts upon a regulating lever, said regulating lever being connected with a feed adjustment member of the fuel injection pump and arranged to traverse an adjustment path, said adjustment path of said regulating lever being limited by a full load stop determining a maximum full load fuel quantity, said injection pump being provided with a control device for setting a position of said stop, characterized in that the control device comprises in combination: a slidably mounted stop piston which acts on the full load stop, a control chamber connected with the suction

chamber via a throttle orifice, a spring chamber in which is disposed a work spring urging the stop piston toward the full load stop, a diaphragm separating said control chamber from said spring chamber, said stop piston further being provided with a bore for slidably receiving a control piston, said control piston further having a front face urged by said pressure in the suction chamber in one direction and having an extremity urged by a control spring in the opposite direction, said control chamber being selectively connectable with said spring chamber via a control means actuatable as a function of the positions of the stop piston and the control piston with respect to one another.

4,418,668

ELECTRONIC IGNITION PULSE GENERATOR

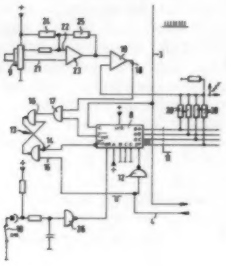
Burkhard Brandner, Werdohl; Manfred Knüfelmann, Düsseldorf, and Reinhold Blauhut, Eggenstein-Leopoldshafen, all of Fed. Rep. of Germany, assignors to Atlas Aluminium-Fahrzeugtechnik GmbH, Werdohl, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,734

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045246

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—416 **8 Claims**



1. An adjustment pulse generator for the electronic ignition pulse generator of an internal combustion engine, particularly of the type which has a carburetor in its fuel system, which ignition pulse generator includes an angle-of-rotation pulse generator producing a sequence of pulses in synchronism with the rotation of a shaft of the engine and a cycle signal of fixed phase value which serves as a reference point in each cycle, and an ignition point computer determining the timing of an ignition signal in terms of a variable phase lag from said cycle signal, in accordance with timing adjustment parameters which reflect changing conditions of engine operation such as engine speed and engine intake pressure, the adjustment pulse generator comprising in combination:

a resettable 2^n-binary counter adapted to receive and count the angle-of-rotation pulses, the counter including at least one reset entry, a count entry, a count-blocking entry, and a full-count exit, as well as a collection line with n separate conductors for the transmission of an adjustment pulse count to the ignition point computer;

a digital-to-analog converter connected to the collection line of the binary counter and producing a corresponding incrementally increasing count-reflective analog voltage;

a pressure transducer measuring the air pressure in the engine intake duct by producing a corresponding pressure-reflective voltage;

a first voltage comparator comparing the count-reflective and pressure-reflective voltages and producing an output signal corresponding to their difference; and

an RS flip-flop gate having a set-entry receiving the cycle signal, a set-exit connected to the count-blocking entry of the binary counter, and a reset-entry connected to the exit of the first voltage comparator and to the full-count exit of the binary counter.

4,418,669

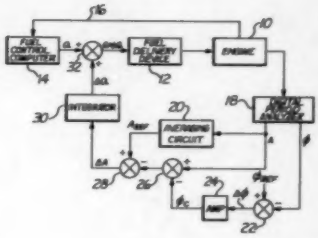
FUEL DISTRIBUTION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Edwin A. Johnson, Clarkston, and Chun K. Leung, Bloomfield Hills, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 19, 1982, Ser. No. 399,537

Int. Cl.³ G06F *15/20*; B60K *41/18*; F02D *5/00*

U.S. Cl. 123—436 **21 Claims**



1. A fuel distribution control for an internal combustion engine comprising:

means for computing the phase angle and amplitude signals indicative of the torque impulses applied to a rotary member of the engine by the combustion process in each engine cylinder;

first difference means for comparing said computed phase angle signal with a reference phase angle to generate a phase angle correction signal;

first sum means for summing said computed amplitude signal with said phase angle correction signal to generate a corrected amplitude signal;

second difference means for comparing said corrected amplitude signal with a reference amplitude signal to generate an amplitude error signal;

integrator means for integrating said amplitude error signals to generate a fuel quantity correction signal for each engine cylinder;

fuel control computer means for generating a fuel quantity signal for each engine cylinder in response to detected engine parameters; and

second sum means for summing said fuel quantity signals with said fuel quantity correction signals to change the quantity of fuel delivered to the engine tending to equalize the amplitude of the torque impulses generated by the individual engine cylinder.

4,418,670

FUEL INJECTION PUMPING APPARATUS

David F. Lakin, London, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sep. 10, 1981, Ser. No. 301,019

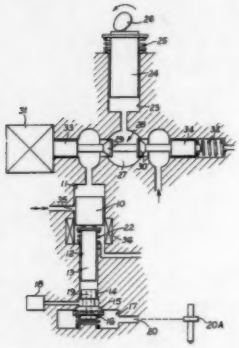
Claims priority, application United Kingdom, Oct. 10, 1980, 8032778

Int. Cl.³ F02D *1/02*

U.S. Cl. 123—446 **3 Claims**

1. A fuel injection pumping apparatus for supplying fuel to an injection nozzle of an internal combustion engine comprising piston means contained within a bore, an outlet from one end of the bore, said outlet in use communicating with an inlet of the nozzle, a fuel inlet to said one end of the bore connected in use to a source of fuel under pressure, a valve operable to prevent flow of fuel through said inlet during delivery of fuel through said outlet, a reciprocable plunger contained within a cylinder, engine operated cam means for urging the plunger

towards one end of the cylinder, passage means connecting said one end of the cylinder with the other end of said bore whereby liquid displaced during movement of the plunger by the cam will act on said piston means to urge the piston means to displace fuel through said outlet, a solenoid controlled two-way valve operable to permit liquid flow in one position between the bore and the cylinder and in the other position between the cylinder and a source of liquid, a transducer for providing a signal indicative of the position of said piston means, and a control circuit for controlling the operation of said valve whereby in use, during inward movement of the plunger by the cam the valve is moved to said one position when delivery of fuel is required and is returned to the other



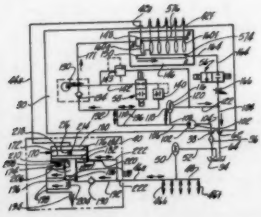
position after said piston means has moved a predetermined extent during the time when the plunger is allowed to move outwardly by the cam, said two way valve comprising a valve chamber, first passage means connecting said valve chamber with said cylinder, a second passage means extending from said chamber and communicating with said bore, a third passage means extending from said chamber for connection to a source of liquid under pressure, first and second seatings disposed about said second and third passage means respectively, a valve member disposed in said chamber, said valve member mounting first and second valve heads for cooperation with said first and second seatings respectively, and pressure balancing pistons being exposed to the pressure in said bore and the pressure of liquid supplied from said source respectively.

4,418,671

DUAL SOLENOID DISTRIBUTOR PUMP

Charles R. Kelso, Farmington, and Richard P. Walter, Southfield, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 17, 1980, Ser. No. 217,352
Int. Cl.³ F02M *59/42*; F02B *77/00*
U.S. Cl. 123—450 **9 Claims**



1. A distributor pump having a metering and an injection mode of operation and adapted to receive electric control signals from a controller and further adapted to receive fluid from a fluid reservoir for supplying pressurized fluid comprising:

a housing having a return port adapted to be connected to the reservoir, an input port adapted to receive fluid from the reservoir and further having a plurality of output ports;

first pressure source means for supplying pressurized fluid at a determinable first pressure level;

timing valve means, that is normally open, for diverting the output of said first pressure source means to a distributor valve means during the injection mode of operation and for diverting the output of said first pressure source means to said return port during the metering mode of operation, said timing valve means adapted to receive electrical signals in timed relationship to the combustion process within the engine;

metering valve means, that is normally closed, connected between said distributor valve means and said return port for controlling the duration of fluid flow from said distributor valve means to said return port during the metering mode in correspondence with the combustion process within said engine and wherein said metering valve means is adapted to receive electrical signals in timed sequence to the combustion process within an engine;

distributor valve means for receiving fluid under pressure from said first pressure source means including first distributor means for sequentially connecting the pressurized fluid to a particular one of said output ports in timed sequence with the operation of said timing valve means and with the combustion process within the engine, said distributor valve means further including second distributor means for sequentially connecting said particular one of said output ports to said metering valve means for a determinable length of time prior to the time said particular one of said output ports is connected to said first pressure source means; and

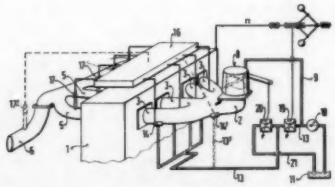
first orifice means located between said metering valve means and said return port for regulating the rate at which fluid flows from said distributor valve means to said return port.

4,418,672

FUEL SUPPLY SYSTEM

Klaus Müller, Tamm; Franz Rieger, Aalen, and Ernst Linder, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 6, 1981, Ser. No. 241,332
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 3008618
Int. Cl.³ F01N *3/15*
U.S. Cl. 123—478 **6 Claims**



1. A fuel supply system for a mixture-compressing internal combustion plural cylinder engine having internally-supplied ignition, and including a primary mixture formation unit disposed in a common intake tube having branches leading to individual cylinders of said engine and at least one supplementary mixture formation unit also disposed in each of the branches thereof, characterized in that at least one ultrasonic atomizer nozzle serves as said supplementary mixture forma-

tion unit and is disposed in said intake tube branch downstream of said primary mixture formation unit, triggering of each of said ultrasonic atomizer nozzles is effected by programmable means stored in a memory of an electronic control device, said memory having stored therein a performance graph showing the non-uniform distribution of the mixture to the individual cylinders of said engine, and said engine further including individual exhaust manifold lines, and exhaust sensor means in each of said lines for detecting oxygen content in the exhaust gas, and for controlling said at least one ultrasonic atomizer nozzle via said electronic control device.

4,418,673

ELECTRONIC CONTROL FUEL INJECTION SYSTEM FOR SPARK IGNITION INTERNAL COMBUSTION ENGINE

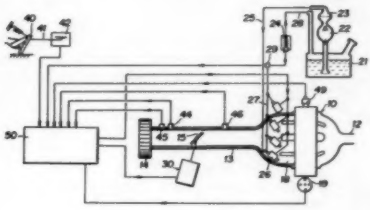
Noboru Tominari, Tokyo, and Takashi Ishida, Ohi, both of Japan, assignors to Mikuni Kogyo Co., Ltd. and Noboru Tominari, both of Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 318,867

Claims priority, application Japan, Nov. 28, 1980, 55-168361

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—478 **18 Claims**



1. An electronic control fuel injection system for an internal combustion engine for preferentially determining a fuel flow rate according to the stroke of an accelerator pedal and subordinately determining an air flow rate in response to the engine operating state comprising:

a fuel metering mechanism for selecting a fuel discharge amount in accordance with the depression stroke of an accelerator pedal and feeding said selected fuel discharge amount through an injector mechanism to said engine,

an air flow sensor for detecting the intake air flow rate to said engine,

a fuel pressure detector provided in a fuel supply line feeding said injector mechanism for detecting fuel pressure in said line,

an air pressure detector for detecting air pressure in the vicinity of said injector mechanism,

means for correcting said selected fuel discharge amount in accordance with the outputs of said fuel pressure detector and air pressure detector to achieve a predetermined fuel pressure difference across said injector mechanism,

at least one engine parameter sensor,

a computer receiving output signals from said fuel metering mechanism, said air flow sensor and said engine parameter sensor and determining therefrom an optimum air flow rate and producing an air flow rate control signal in accordance with a desired operating state of the engine, and

a throttle valve control mechanism for setting the opening of a throttle valve of said engine in accordance with the air flow rate control signal produced by said computer.

4,418,674

ELECTRONIC FUEL INJECTION CONTROL SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES

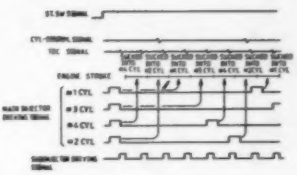
Shumpei Hasegawa, Niiza, and Akihiro Yamato, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,608

Claims priority, application Japan, Jun. 10, 1981, 56-89025

Int. Cl.³ F02D *5/02*

U.S. Cl. 123—491 **3 Claims**



1. An electronic fuel injection control system for electronically controlling the quantity of fuel being supplied to an internal combustion engine having a plurality of cylinders, an output shaft, and a starter, comprising: a sensor for detecting at least one predetermined angular position of said output shaft of said engine to generate a signal indicative of a detected angular position; a plurality of fuel injection valves corresponding in number to said cylinders, each provided for each of said cylinders; a control circuit adapted to cause opening of said fuel injection valves in synchronism with generation of said angular position signal, for supplying a controlled amount of fuel into said cylinders; and a starting switch adapted to actuate said starter of said engine when closed; said control circuit being operable to cause opening of all said fuel injection valves at the same time to supply fuel into respective ones of said cylinders immediately upon closing of said starting switch, keep closing of all said fuel injection valves until after all said cylinders have pistons thereof complete respective first suction strokes thereof after said closing of said starting switch, and upon completion of said first suction strokes of all said cylinders, cause successive opening of said fuel injection valves in predetermined sequence in synchronism with subsequent generation of said angular position signal occurring after the completion of said first suction strokes of all said cylinders to supply fuel to respective ones of said cylinders.

4,418,675

ADJUSTING DEVICE FOR A FUEL-INJECTION PUMP OF AN INTERNAL COMBUSTION ENGINE

Gerd Niemeier, Stuttgart, and Ulrich Conrad, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 17, 1982, Ser. No. 349,518

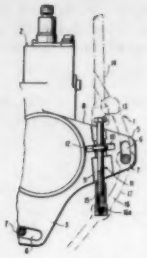
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105738

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—501 **6 Claims**

1. A device for adjusting a start time of fuel delivery of a fuel-injection pump, comprising a fuel-injection pump including a flange means for enabling a mounting of the fuel-injection pump on an internal combustion engine, the adjusting device includes an adjusting member, guide means being provided in the flange means for rotatably and nonaxially displaceably receiving the adjusting member, mounting means adapted to be secured on the engine for adjustably accommodating the adjusting member so as to enable an adjustment of the fuel-injection pump upon an adjustment of the adjusting member with respect to the mounting means, the guide means including a

recess formed in the flange means, and an annular slot formed in the recess, and the adjusting member including a collar



means adapted to be disposed in the annular slot so as to prevent an axial displacement of the adjusting member.

4,418,676

CARBURETION SYSTEM FOR A V-TYPE INTERNAL COMBUSTION ENGINE

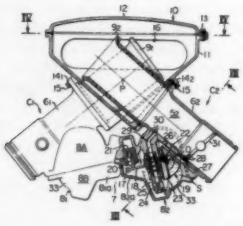
Suminari Iwao, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1982, Ser. No. 409,530

Claims priority, application Japan, Aug. 19, 1981, 56-130585

Int. Cl.³ F02B *13/00*

U.S. Cl. 123—580 **4 Claims**



1. In an improved carburetion system for a V-type internal combustion engine comprising a first carburetor and a second carburetor disposed in a space between a first cylinder and a second cylinder arranged in the form of V-shape and adapted to supply an air-fuel mixture to the respective cylinders, said carburetors each including an intake barrel and a float chamber in which fuel to be supplied to said intake barrel is stored, said intake barrel having an inlet port and an outlet port and defining an intake passage leading to the associated cylinder, the improvement wherein the intake barrels of both the carburetors are arranged in the ultimate proximity of one another in such a manner that they intersect one another and a point of intersection of the intake barrels is offset from the middle part of the intake barrels toward the inlet port of the latter so that the float chambers are located in a space between both the intake barrels below the point of intersection.

4,418,677

ALTERNATOR FOR IGNITION SYSTEM AND AUXILIARY POWER

Gloris R. Hofmann, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 3, 1981, Ser. No. 317,827

Int. Cl.³ F02P *1/02, 5/04, 3/06*

U.S. Cl. 123—599 **4 Claims**

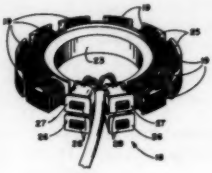
1. An alternator apparatus for supplying electrical power to a capacitor discharge ignition system of an internal combustion engine and for supplying electrical power to a separate power load, said alternator apparatus comprising:

(A) an engine driven flywheel mounted for rotation on said engine, said flywheel including a circumferential flange;

(B) a plurality of circumferentially spaced magnets mounted on the flange of said flywheel and lying in a common plane; and

(C) a stator assembly mounted on said engine concentrically with said flywheel and radially inward of said flange, said stator assembly including

(1) a circular magnetic core having a plurality of circumferentially spaced radial power poles lying in the plane of said magnets and at least two radial ignition poles offset from said plane,



(2) power windings mounted on each of said power poles, and

(3) ignition windings on each of said ignition poles, said ignition windings including a high speed winding and a low speed winding with said high speed winding having a substantially smaller number of turns of heavier wire than said low speed winding, all of said windings responding to the magnetic field created by said magnets to generate electrical outputs.

4,418,678

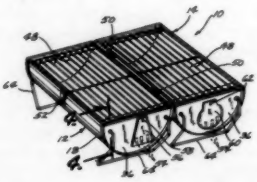
INSULATED BARBEQUE UNIT

Frederick J. Erickson, Des Moines, Iowa, assignor to Ehco, Inc., De Moines, Iowa

Filed Nov. 16, 1981, Ser. No. 321,741

Int. Cl.³ A47J *37/00*; F24C *1/16*

U.S. Cl. 126—9 R **7 Claims**



1. A barbeque unit comprising:

a rectangular inner wall having opposite side edges and opposite end edges, said inner wall being curved so that said side edges are presented upwardly, thereby forming an upwardly presented concave surface and a downwardly presented convex surface;

a rectangular outer wall having opposite side edges and opposite end edges, said side edges of said outer wall being curved upwardly so that said outer wall forms an upwardly presented concave surface and a downwardly presented convex surface;

an inner end connecting means joining said upper edges of said inner and outer walls and holding said inner and outer walls together in nested relationship with at least a portion of said convex surface of said inner wall being spaced from at least a portion of said concave surface of said outer wall to define a cavity therebetween;

grate means extending between said opposite edges of said inner and outer walls and bridging across and above said upwardly presented concave surface of said inner member;

a pair of spaced apart end walls each extending in a plane perpendicular to said inner and outer walls and each being joined to one of said end edges of said inner and outer walls;

heat insulating material filling said cavity whereby heat from coals resting on said concave surface of said inner wall will be substantially insulated from said outer wall,

said concave surface of said outer wall forming one-half of a circular cylinder and said end walls being shaped in a semi-circle and forming the axial ends of said one half of said circular cylinder, and

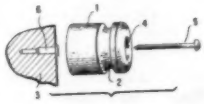
a second outer wall forming a second half cylinder indentical to said first half cylinder formed by said first mentioned outer wall, a second pair of endwalls being joined to said second outer wall to form axial ends of said second half cylinder, hinge means interconnecting one of said edges of said first outer wall to one of said edges of said second outer wall to permit said first and second cylinder halves to pivot about a horizontal axis therebetween from a joined position wherein said first and second half cylinders form a complete circular cylinder to a spread position approximately 180° therefrom.

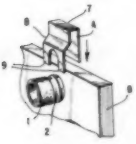
4,418,679

CERAMIC WALL SPACER KIT

Roy N. Grayson, Aristo-mat, Inc., 1718 E. 75th St., Chicago, Ill. 60649

Filed Jun. 5, 1980, Ser. No. 156,672
Int. Cl.³ F24C *15/36*
U.S. Cl. 126—201 **3 Claims**





1. A ceramic wall spacer kit for mounting a stove board comprising:

at least one ceramic spacer separating the stove board from a wall, said spacer having about its periphery a groove;

means for mounting said spacer to a wall; and

a bracket for affixing said spacer to the stove board, said bracket having two portions, one portion being a rectangular shaped channel that snaps down over the top of the stove board, and extending therefrom to the wall side, the other portion being a yoke having two downward directed prongs that engage the groove in the spacer, thus affixing the board to the spacer.

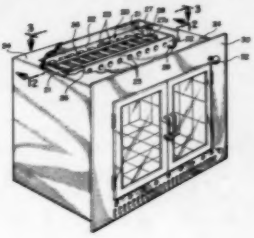
4,418,680

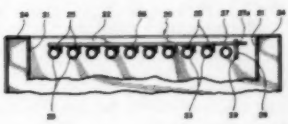
FIREPLACE DAMPER AND AIR FLOW CONTROL

Lynn C. Broadbent, Utah County, Utah, assignor to Merle Y. Broadbent, Alpine, Utah, a part interest

Filed May 6, 1981, Ser. No. 261,049
Int. Cl.³ F23L *3/00*
U.S. Cl. 126—289 **6 Claims**

1. A fireplace damper and airflow control for use with fireplaces or stoves having a plurality of heat tubes extending through the exhaust passage for smoke and other products of combustion, comprising a plurality of slats secured in spaced, side-by-side relation to one another, each slat being adapted to be positioned above a heat tube when the damper is in open position so as to leave the spaces between the heat tubes substantially unobstructed, and each slat having a width greater than the space between the heat tube over which it is positioned when the damper is open and an immediately adjacent





heat tube; and means for moving the slats in unison from position over the heat tubes to position where the slats block or partially block the spaces between the heat tubes, the slats being arranged so that, when in closed position, the slats substantially block the spaces between the heat tubes but the spaces between the outside heat tubes and the opposite edges of the exhaust passage remain at least partially open.

4,418,681

ASPHALT HEATING KETTLE APPARATUS

Albert L. Moody, Lawrenceville, Ga., assignor to F. C. Brown Rentals, Inc., Smyrna, Ga.

Filed Dec. 10, 1980, Ser. No. 214,631
Int. Cl.³ F24H *1/00;* **E01C** *19/45*
U.S. Cl. 126—343.5 R **8 Claims**

1. Apparatus for heating a quantity of normally solid material to maintain the material in a liquid state without overheating the material to an excessive temperature which may ignite the material, comprising in combination:

means defining a chamber to receive a quantity of material to be heated;

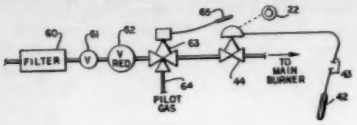
means defining a flue in heat transfer relation with the material in said chamber;

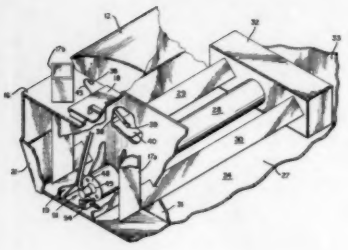
heater means selectably operative to introduce hot gas to said flue, so as to heat the material in said chamber;

temperature responsive means operative to sense the temperature of the material in said chamber and also responsive to the temperature of said flue in said chamber; and

said heater means being operatively associated with said temperature responsive means to reduce the temperature of said heater means in response to a sensed predetermined

maximum temperature either of said flue in said chamber or of the material in said chamber, so as to prevent either





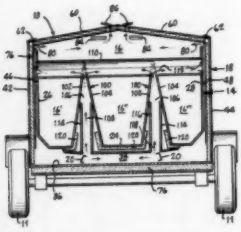
the flue or the material in said chamber from exceeding said maximum temperature.

4,418,682

ASPHALT RECLAMATION UNIT

Anton H. Heller, Levittown, N.Y., assignor to Poweray Infrared Corporation, Amityville, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,661
Int. Cl.³ E01C *19/08*
U.S. Cl. 126—343.5 A **8 Claims**



1. An asphalt reclamation unit for heating initially solid asphaltic material from ambient atmospheric temperature to an elevated temperature between about 275° F. and about 300° F. and thereafter maintaining the material at the elevated temperature to provide asphaltic concrete in a condition suitable for paving application or the like, comprising:

(a) an upwardly open inner enclosure defining a volume for containing asphaltic material to be heated, and including a floor, end walls, and side walls;

(b) an outer enclosure surrounding said inner enclosure and including a floor, end walls, and side walls respectively disposed in adjacent spaced relation to the floor, end walls, and side walls of said inner enclosure to define a gas space between the inner and outer enclosure floors and end and side wall gas passages between the inner enclosure walls and the outer enclosure walls respectively adjacent thereto, said outer enclosure further including door means for closing the top of the unit, said gas space communicating with the outside atmosphere, said passages communicating with said gas space and with the uppermost portion of said volume, and said upper portion of said volume being vented to the outside atmosphere, for enabling continuous air flow into said gas space and thence through said passages and said upper portion of said volume;

(c) at least one source of infrared energy disposed in said gas space for heating air entering said gas space from the outside atmosphere;

(d) heating chamber means comprising at least one heating chamber projecting upwardly from the floor of the inner enclosure into an upper portion of said volume at a locality intermediate and spaced from the side walls of said inner enclosure, said one heating chamber extending from end to end of said inner enclosure and comprising thermally conductive wall portions of said inner enclosure defining a gas flow region isolated by the wall portions from said volume and opening into and extending upwardly from said gas space above said one infrared energy source; and

(e) flue means, comprising at least one flue extending from side to side of said inner enclosure and spaced away from both ends thereof, for conducting heated air from the uppermost portion of said gas flow region transversely across said upper portion of said volume to said side wall passages, such that air heated by said source flows upwardly through said gas flow region and thence through said flue means to the side wall passages;

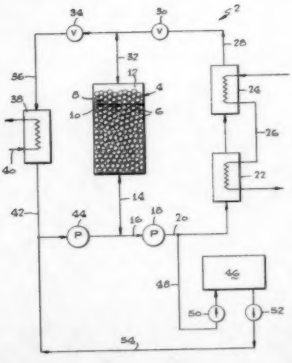
(f) said walls of said inner enclosure, said heating chamber means, and said flue means being mutually disposed to enable delivery of solid pieces of the asphaltic material downwardly from the top of the unit into the lowermost portion of said volume.

4,418,683

SEPARATED PHASE THERMAL STORAGE SYSTEM

Jerome M. Friefeld, Agoura, and Joseph Friedman, Encino, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 23, 1981, Ser. No. 256,641
Int. Cl.³ F24H *7/00*; F28D *13/00*; C09K *5/00*
U.S. Cl. 126—400 **2 Claims**



1. A thermal storage system comprising:

a storage tank;

a quantity of particulate iron pyrite situated within said storage tank as a heat storage material; and

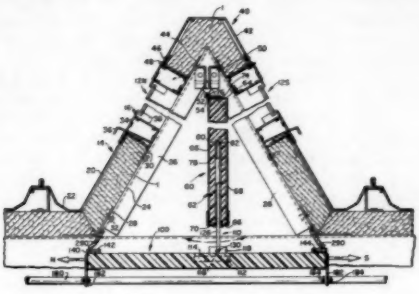
a quantity of sulfur located within said storage tank in contact with said pyrite as a heat exchange material.

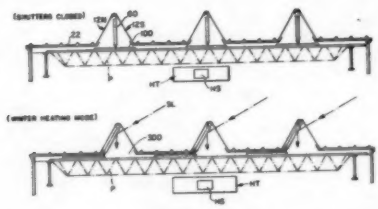
4,418,684

ROOF APERTURE SYSTEM FOR SELECTIVE COLLECTION AND CONTROL OF SOLAR ENERGY FOR BUILDING HEATING, COOLING AND DAYLIGHTING

William J. Sanders, Kansas City; Marvin K. Snyder, Overland Park, both of Kans., and James W. Harter, Independence, Mo., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Aug. 18, 1981, Ser. No. 293,998
Int. Cl.³ F24J 3/02
U.S. Cl. 126—419 **20 Claims**





1. A roof aperture system for selective collection and control of solar energy for heating, cooling and daylighting a building comprising:

a pair of solar energy and daylight transmittimg panels mounted on a frame to cover an aperture in a roof of a building, each of said panels being exposed to a separate direction of sun incidence;

heat storage means located below said panels to have solar energy directed thereto after such solar energy has passed through said panels;

closure means mounted adjacent said panels for controlling the amount of solar energy passing into the building aperture via said panels, said closure means including a shutter rectilinearly movably mounted on said roof adjacent said panels, a shade pivotally suspended from said frame, connecting means connecting said shutter to said shade in a manner which causes said shade to move in cooperation with said shutter, and shutter moving means connected to said shutter for moving said shutter so that the amount of solar energy passing into a building through said panels can be controlled.

4,418,685

ROOF-MOUNTED SOLAR COLLECTOR DEVICE

Wallace N. Frazier, 15919 Notting Hill Dr., Lutz, Fla. 33549

Filed Jul. 8, 1981, Ser. No. 281,471
Int. Cl.³ F24J 3/02
U.S. Cl. 126—428 **5 Claims**

1. A passive solar collector device adapted to be mounted in operative position on the roof of a building having an interior air space beneath the roof and a vent opening through the roof in fluid communication with the interior air space,

(a) a solar collector panel comprising an elongated solar collecting chamber having opposite end portions and opposite side portions and an uninsulated thermal-conductive bottom wall of pre-determined substantial area,

(b) means for conducting a heat transfer fluid through said collecting chamber in heat-transfer relationship with said bottom wall, including a fluid inlet and a fluid outlet,

(c) an uninsulated thermal-conductive bearing plate beneath, and at least co-extensive with, said bottom wall, said bearing plate being adapted to seat flush against, and in thermal-conductive relationship with, a portion of a roof upon which the solar collector device is mounted in operative position, (d) thermally conductive end members spaced apart longitudinally of and fixed to said bearing plate, and in thermal-conductive relationship between said bottom wall and said bearing plate, said end members supporting said solar collector panel in spaced relationship above said bearing plate and said bottom wall,

(e) an air inlet port extending through said bearing plate and adapted to register with the vent opening through the

roof, when the solar collector device is mounted in its operative position upon the roof, said air inlet port being in fluid communication between said air space and the interior air space beneath the roof,

(f) opposed side openings between the respective side portions of said bottom wall and said bearing plate and between said end members in open fluid communication with said air space to permit the free passage of ambient air transversely through said air space and across said air inlet port, so that air in said air space is in heat transfer relationship with said bottom wall, said bearing plate and said end members, and is in fluid communication with the atmospheric air outside said solar collector panel and the interior air space beneath the roof, when the solar collector device is in said operative position.

4,418,686

IMPLANT FOR INHIBITING MASTITIS IN DAIRY CATTLE

Francis W. Child, Cody, Wyo., assignor to Child Laboratories Inc., Cody, Wyo.

Division of Ser. No. 62,707, Aug. 1, 1979, Pat. No. 4,308,859.
This application Jul. 20, 1981, Ser. No. 285,259
Int. Cl.³ A61B 19/00
U.S. Cl. 128—1 R **10 Claims**

1. An implant for insertion through the teat milk duct and into the udder of an animal having an udder and teat attached

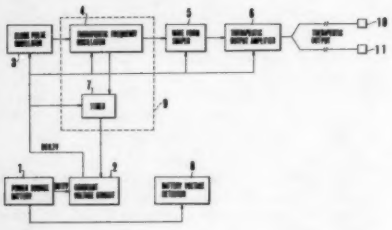
thereto in inhibiting growth of mastitis causing bacteria in the udder and milk duct comprising: a non-electrically conductive flexible core of a size allowing insertion through the teat milk duct for placement in the udder of an animal, said core being an elongated continuous flexible plastic string, a plurality of bands surrounding and attached to the core, adjacent bands being spaced from each other and having no electrically mechanical connection therebetween, and metal means covering each band, said metal means on some of the bands including metallic silver for generating silver ions having bactericidal action when located in the udder to inhibit growth of mastitis causing bacteria in the udder and milk duct.

4,418,687

ELECTRIC SLEEP INDUCER

Junji Matsumoto, Tokushima; Shohei Kamiya, and Yasuhiko Sugihara, both of Tokyo, all of Japan, assignors to Homer Ion Laboratory Co., Ltd., Japan

Filed Mar. 4, 1982, Ser. No. 354,626
Claims priority, application Japan, Mar. 27, 1981, 56-44882
Int. Cl.³ A61N *1/34*
U.S. Cl. 128—1 C **5 Claims**



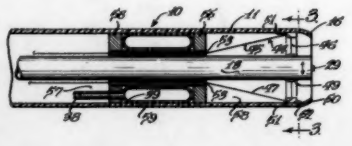
1. An electric sleep inducer comprising:
a control circuit means for producing a therapeutic wave-form output which is applied at frequency values controlled non-stepwise to gradually decrease from 14 Hz to 0 Hz in a non-stepwise manner and adapted to a sleeping electroencephalogram; and
cathode and anode conductor means for applying the therapeutic wave-form output of the control circuit to the head.

4,418,688

MICROCATHETER HAVING DIRECTABLE LASER AND EXPANDABLE WALLS

Marvin P. Loeb, Chicago, Ill., assignor to Laserscope, Inc., Arlington Heights, Ill.

Filed Jul. 6, 1981, Ser. No. 280,247
Int. Cl.³ A61B *1/00*
U.S. Cl. 128—6 **22 Claims**



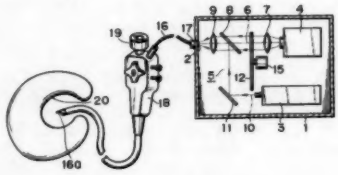
1. A fiber optic microcatheter device suitable for performing medical procedures in a lumen within a patient, the microcatheter device comprising:
(a) an elongated external tube constructed of a flexible material, having a distal end and a peripheral elastic, expandable zone spaced from the distal end;
(b) an elongated flexible internal conduit having a distal end proximate to the distal end of the external tube and positioned within the external tube;
(c) at least one fiber optic viewing bundle located within the internal conduit and substantially coterminous with the distal end of the internal conduit to permit viewing within the lumen.
(d) at least one laser light transmitting fiber located within the internal conduit and substantially coterminous with the distal end of the internal conduit to permit propagation of laser light through the conduit to a site within the lumen;
(e) expanding means associated with the elastic, expandable zone for increasing the outside diameter of the zone so as to form a liquid seal with the lumen;
(f) a substantially rigid collar inside and in contact with the external tube, the collar located between the elastic zone and the distal end of the external tube; and
(g) a conduit directing system including at least one cable having a directing length portion between the internal conduit and the collar such that shortening of the directing length portion tilts the distal end of the internal conduit with respect to the external tube, the cable also including a control length portion attached to the directing length portion to shorten the directing length portion.

4,418,689

LASER DEVICE FOR AN ENDOSCOPE

Akira Kanazawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1981, Ser. No. 302,468
Claims priority, application Japan, Sep. 22, 1980, 55-132196; Oct. 24, 1980, 55-151734[U]
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—6 **3 Claims**



1. A combination of an endoscope and laser device, wherein the endoscope comprises an insertable channel, a laser probe which is detachably taken into the insertable channel and is provided with a light-emitting member projecting from the insertable channel, and an observation section; and the laser device emits medical treatment laser beams and illumination light beams into the endoscope through the laser probe, and comprises a housing provided with a light-emitting section to which the laser probe can be connected, a medical treatment laser beam oscillator held in the housing conprising an infrared laser beam oscillator which can emit laser beams, a light source means received in the housing which can selectively emit at least two visible rays having different colors, said light source means being capable of issuing nonmonochromatic light beam and having means for selectively converting said nonmonochromatic light beams into light beams having at least two different colors comprising two different colored filters and means for selectively setting said two filters on the optical axis of the nonmonochromatic light beams, and an optical system which converges laser beams emitted from the medical treatment laser beam oscillator and visible rays sent forth from the assembly of illumination light sources, thereby conducting said laser beams and illumination light beams to the light-emitting section.

4,418,690

APPARATUS AND METHOD FOR APPLYING A DYNAMIC PRESSURE WAVE TO AN EXTREMITY

Thomas A. Mummert, Toledo, Ohio, assignor to Jobst Institute, Inc., Toledo, Ohio

Filed Aug. 3, 1981, Ser. No. 289,380
Int. Cl.³ A61H *1/00*
U.S. Cl. 128—24 R **13 Claims**

1. An apparatus for applying a dynamic pressure wave against a mammal extremity comprising:

an inflatable cylindrical cone chamber tapering from a larger diameter outer end to a smaller diameter inner end, said cone chamber adaptable for surrounding the extremity without applying any pressure thereto when inflated;

an inflatable sleeve chamber enclosing said cone chamber, said sleeve chamber adaptable for exerting a compressive force against the exterior of said cone chamber and the extremity surrounded therein when inflated; and

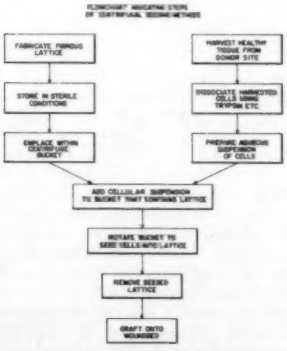
pneumatic control means pneumatically connected to said cone chamber and said sleeve chamber for inflating and deflating said chambers according to a predetermined sequence, whereby said compressive force is applied to the extremity as a dynamic pressure wave.

4,418,691

METHOD OF PROMOTING THE REGENERATION OF TISSUE AT A WOUND

Ioannis V. Yannas, Newton Center; John F. Burke, Belmont; Dennis P. Orgill, Cambridge, and Eugene M. Skrabut, Beverly, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 26, 1981, Ser. No. 315,234
Int. Cl.³ A61L *15/00*
U.S. Cl. 128—156 **18 Claims**


FABRICATE FIBROUS LATTICE
HARVEST HEALTHY TISSUE FROM DONOR SITE
STORE IN STERILE CONDITIONS
DISSOCIATE HARVESTED CELLS USING TRYPSIN ETC.
EMPLACE WITHIN CENTRIFUGE BUCKET
PREPARE AQUEOUS SUSPENSION OF CELLS
ADD CELLULAR SUSPENSION TO BUCKET THAT CONTAINS LATTICE
ROTATE BUCKET TO SEED CELLS INTO LATTICE
REMOVE SEEDED LATTICE
GRAFT ONTO WOUNDED

14. A method of promoting the regeneration of damaged or removed tissue at a wound, comprising the following steps:

a. creating a suspension of cells in a liquid that has a lower density than said cells;

b. placing said suspension of cells in contact with a fibrous lattice within a container that is suitable for centrifugal rotation;

c. rotating said container at a speed and duration sufficient to embed a substantial number of cells into said lattice;

d. securing said lattice in contact with said wound;

e. monitoring the growth of cells within or upon said lattice;

f. distributing a quantity of an aqueous suspension of said cells of the desired variety into or upon the regions of said lattice where the centrifugally seeded cells are not growing adequately.

4,418,692

DEVICE FOR TREATING LIVING TISSUE WITH AN ELECTRIC CURRENT

Jean-Louis Guay, 8770 Moorhead Cir., E., Boulder, Colo. 80303

Filed Nov. 17, 1978, Ser. No. 961,569
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.14 **19 Claims**

1. A device for treating living tissue with an electrical current from a power source, comprising in combination:

a substantially cylindrical body member having a first end and a second end;

a sleeve, having one end disposed within said second end of said body member and a terminal end extending therefrom;

means for fixably mounting said one end of said sleeve within said second end of said body member;

a piston, slidaby mounted relative to said body member and slidably received within said sleeve;

urging means for urging said piston to a first position relative to said body member and said sleeve;

means for moving said piston to a second position relative to said body member and said sleeve against said urging means;

a first and a second electrode element;

means for mounting at least one of said first and second electrode elements, for movement in accordance with the movement of said piston;

means to control the divergence and convergence of said first and second electrode elements upon a reciprocating longitudinal movement of said piston;

said first and second electrode elements disposed to grasp the living tissue when said piston is in said first position and disposed to release the living tissue when the piston is in said second position; and

means for connecting said first and second electrode elements to the electrical power source to provide an electrical current flow relative to the living tissue; said connecting means including switch means mounted on said body member and means mounted on said piston cooperating with said switch means, to allow said electrical current flow only when said piston is in said first position.

4,418,693

VEIN AND TUBING PASSER SURGICAL INSTRUMENT

Eric G. LeVeen, 3-3 Woodlake Rd., Albany, N.Y.; Robert F. LeVeen, 312 Lombard St., Philadelphia, Pa. 19147, and Jeanette L. Rubricius, 321 Confederate Cir., Charleston, S.C. 29407

Filed Dec. 10, 1980, Ser. No. 215,047
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—303 R **11 Claims**

1. An apparatus for vessel transfer comprising a tubular outer member and an inner slidable member, one of which is rigid and one of which is flexible, said tubular outer member and inner slidable member being adapted to be passed through body tissue to an elected distant site which has been surgically exposed, a handle means extending aside and fixed to one end of said outer member, said handle means being adapted to insert said tubular outer member containing said inner slidable

member into body tissue and to pull said tubular outer member from body tissue leaving said inner slidable member in body tissue, and attaching means adapted to attach a hollow vein, prosthesis or elastomeric tubing to one end of the flexible member after removing the outer member from the body tissue so that the flexible member can be used to pull said hollow

vein, prosthesis or elastomeric tubing through the body tissue to said elected distant site, said attaching means comprising a body adapted to be inserted into said hollow vein, prosthesis or elastomeric tubing, said body having a diameter of at least a portion of its surface greater than the interior diameter of said hollow vein, prosthesis or elastomeric tubing.

4,418,694

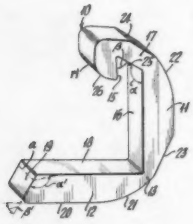
NON-METALLIC, BIO-COMPATIBLE HEMOSTATIC CLIPS

Howard Beroff, Bridgewater; Namassivaya Doddi, Manville, and Stephen J. Jewusiak, Denville, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 49,376, Jun. 18, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 282,461

Int. Cl.³ A61B *17/12, 17/00*

U.S. Cl. 128—326 **4 Claims**



1. A sterile, plastic, hemostatic clip comprising:

first and second leg members joined at their proximal ends by resilient hinge means and terminating at their distal ends in latch means, each leg member having an outer surface and a vessel clamping inner face, said vessel clamping inner face being in opposition to the vessel clamping inner face of the other leg member;

said first leg member having a body portion and a latch portion, said latch portion being disposed at the distal end of said leg member, said latch portion comprising a deflectable hook member extending from the inner face of said first leg member, said hook member having an inner face spaced from the inner face of said first leg member and substantially parallel thereto, said hook member having a connecting face, said connecting face being disposed at an acute angle to the inner face of said hook member and connecting to the inner face of said first leg member at an obtuse angle therewith, said hook member having an end face extending from the inner face of said hook member and and beveled so as to form an acute angle with the inner face of said hook member, the portion of said hook member containing said connecting surface immediately adjacent the body portion of said first leg member having a reduced thickness as compared to the thickness of the first leg member to improve the deflectability of said hook member;

the body portion of said first leg member between said latch portion and said hinge means comprising a center section and two side sections, said center section being the thickest part of said body portion, the outer surface of said center section being parallel to the vessel clamping inner face of said first leg member, a first side section connecting said center section to said latch portion, the outer surface of said first side section having a substantially constant radius of curvature extending from said center section to said latch portion and a second side section connecting said center section to said hinge means, the outer surface of said second side section being tapered from the center section to the resilient hinge means;

said second leg member terminating at the distal end thereof in a complementary locking portion of the latch means, said locking portion comprising an end face of said second leg member, said end face having a bevel complementary to the bevel on the end face of said hook member, said complementary bevel forming an obtuse angle with the inner face of said second leg member and adapted to deflect the said hook member and enter the space between the inner face of said hook member and the inner face of said first leg member, the greater portion of the outer surface of said leg member being substantially parallel to the inner face of said member;

whereby when said first and second leg members are pivoted about said hinge means the distal end of said second leg member deflects and engages the hook member of the first leg member to lock the clip in a closed position.

4,418,695

IMPLANTABLE CARDIAC STIMULATOR HAVING THERAPEUTIC DIAGNOSTIC FUNCTIONS

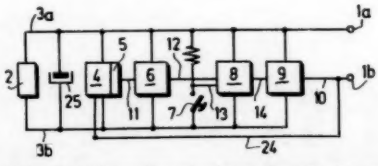
Jacques Buffet, 28 avenue Thiers, 93340 Le Raincy, France

Continuation-in-part of Ser. No. 160,168, Jun. 17, 1980, abandoned, which is a continuation of Ser. No. 20,841, Mar. 15, 1979, abandoned. This application Feb. 18, 1981, Ser. No. 235,553

Claims priority, application France, Mar. 14, 1978, 78 07270

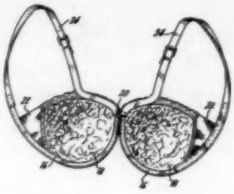
Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **7 Claims**



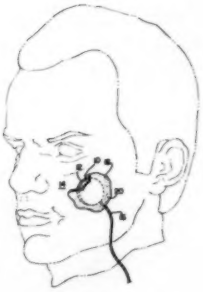
1. An implantable cardiac stimulator adapted to be associated with a cardiac probe, comprising terminals for connections with said probe, amplifier means connected with said terminals to receive and amplify a signal therefrom, band pass filter means for filtering the output of said amplifier means, level detector means receiving the filtered output signal of said filter means and operable to respond to a predetermined signal level, a logic module connected with the output of said level detector means, switch means operable by external magnetic means, said logic module comprising a central unit comprising microprocessor means including register means for recording isolated pulses and successive pulses, clock means providing a time base for said microprocessor, an OR gate having inputs connected with said level detector means and with said switch means and an output connected with said central unit, and memory means connected by a bus with said central unit, and an output stage connected with said logic module and with said terminals.

4,418,696
SUPPORT BRASSIERE
Victoria Delet, 60 West 57 St., New York, N.Y. 10019
Continuation of Ser. No. 67,514, Aug. 17, 1979. This application Nov. 23, 1981, Ser. No. 324,157
Int. Cl.³ A41C *1/14*
U.S. Cl. 128—476 1 Claim



1. A brassiere comprising a pair of bust cups, said bust cups being secured together adjacent to the inner edge, a semi-rigid support member secured along the inner and lower portions of each of said bust cups and extending outwardly from the lower portion of each bust cup to a position beneath the wearer's arm, strap means extending at least from a position adjacent to the outer edge of said semi-rigid support member to a position on the upper portion of one of said bust cups forming a loop extending over the wearer's shoulder, and a flexible side panel secured at the outer edge of each of said bust cups and extending outwardly therefrom to engage the outwardly extending portion of said support member for retaining the outer edge of the cup against the wearer's body.

4,418,697
ELECTRODE ATTACHMENT METHOD
Francine Tama, 48 E. Riding Dr., Cherry Hill, N.J. 08003
Filed Aug. 17, 1981, Ser. No. 293,518
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—640 4 Claims

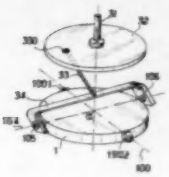


1. A method of securing an electrode to the skin of a human body for treatment or diagnostic purposes, said method being characterized by the steps of:

positioning a surface of the electrode in contact with a desired skin area from which, or into which electrical impulses are to be directed; and

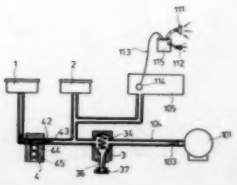
maintaining the electrode in its desired position by confining it within the periphery of a pliable, moldable and stretchable adhesive putty including silicone polymer conforming to the configuration of the electrode and having a peripheral region surrounding the periphery of the electrode and being secured to the skin.

4,418,698
ULTRASONIC SCANNING PROBE WITH MECHANICAL SECTOR SCANNING MEANS
Jacques Dory, 91 rue des Molveaux, 77450 Esbly, France
Filed Jul. 28, 1981, Ser. No. 287,678
Claims priority, application France, Jul. 29, 1980, 80 16717; Jul. 29, 1980, 80 16718
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 9 Claims



1. An ultrasonic probe comprising an elongated casing containing a couplant liquid and fitted at one end with an ultrasonically transmissive window having a substantially plane surface portion, a disc-shaped piezoelectric transducer having a center and immersed in said couplant liquid, electric motor means having a shaft arranged perpendicular to said plane surface portion, mechanical means for coupling said shaft to said piezoelectric transducer, means for energizing the said motor means with an energizing signal at a first frequency whereby an oscillating motion of the shaft is obtained and resetting torque generating means for resetting the said shaft into a reference angular position when the motor means is not energized with the said first frequency, said mechanical coupling means comprising: a connecting rod having first and second ends, linkage means coupled to the first end of said connecting rod for driving the said connecting rod in a conical motion about the a first axis in which the connecting rod rotates upon itself without being allowed to effect any translation along its own length, means for rotatably supporting the said piezoelectric transducer about a diametrical axis fixedly positioned with respect to the said casing, the said first axis and the said diametrical axis being located in the same plane and perpendicular to one aother, a yoke member, means for rotatably supporting said yoke member about an axis which is fixedly positioned with respect to the transducer and passes through the center of the transducer and perpendicular to the said diametrical axis, the said yoke member having a bracket fastened to the said second end of the connecting rod.

4,418,699
TWIN GAUGE AND TWIN NEEDLE SPHYGMOMANOMETERS
Hsu C. Chen, 4th Fl., 11, Lane 132, Sung-Chiang Rd., Taipei, Taiwan
Continuation of Ser. No. 64,529, Aug. 7, 1979, abandoned. This application Feb. 25, 1982, Ser. No. 352,099
Int. Cl.³ A61B *5/02*
U.S. Cl. 28—685 4 Claims



1. A sphygmomanometer, comprising:

a pressure cuff adapted to be worn by a patient;

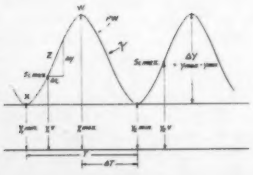
an air pump for pressurizing said cuff;
a valve means and tube means coupling said air pump to said cuff for controlling the flow of air to and from said cuff; and
a guage means coupled via tube means to said cuff for indicating the pressure in said cuff, said gauge means comprising:
a diaphragm responsive to cuff pressure,
an upper diastolic needle means with a shaft and a pinion gear for indicating diastolic blood pressure, the shaft being driven by the motion of said diaphragm,
a lower systolic needle means rotatable independently of said upper needle means for indicating systolic blood pressure;
drive means, coupled to said upper needle means, for engaging and driving said lower needle means when said upper needle means moves only in a first direction indicative of increasing pressure and not in a second direction opposite to said first direction;
lower needle spring return means for biasing said lower needle means in said second direction indicative of decreasing pressure; and
an actuatable clutch assembly means for stopping the motion of only said lower needle means moving in said second direction upon the detection by the user of Korotkov sounds, said lower needle means then indicating a systolic blood pressure, while said upper needle means continues to measure the pressure in said cuff, the motion of said upper needle means in said second direction stopping only when the pressure in said cuff ceases to change such as by the closing of said valve means, said valve means typically being closed upon the occurrence of the last Korotkov sound, thereby causing said upper needle means to indicate diastolic blood pressure, said clutch assembly means comprising a lower needle body element having a bore therethrough, said shaft integral with said upper needle means passing through said bore, said body element having a lower needle spindle at a bottom portion thereof; a lower needle bearing receiving said spindle such that when said spindle and bearing are engaged with one another there is sufficient friction therebetween to stop any relative rotation between said body element and lower needle means even if said shaft and upper needle means are moving; and an actuatable fork clutch means for pressing said spindle into contact with said bearing, whereby when said fork clutch means is actuated, said lower needle means stops any motion thereof.

4,418,700

METHOD AND APPARATUS FOR MEASUREMENT OF HEART-RELATED PARAMETERS

Glenfield Warner, St. Laurent, Canada, assignor to Sylvia Warner, St. Laurent and Thiagas S. Sankar, Brossard, both of, Canada

Filed Mar. 11, 1981, Ser. No. 242,568
Int. Cl.³ A61B 5/02
U.S. Cl. 128—694 **26 Claims**



1. Apparatus for determining the magnitude of heart-related parameters in a patient;
comprising:
means for detecting blood volume, and thereby blood volume variation, in said patient, and for providing a signal representative of said blood volume, and thereby said blood volume variation;
said means for detecting being attachable to said patient to thereby detect said blood volume, and thereby said blood volume variation;
said blood volume variation being cyclic in nature whereby said signal comprises a cyclic curve having, in each cycle of variation, a variable slope, a maximum amplitude, a minimum amplitude, a time interval between said maximum amplitude and said minimum amplitude, and a pulse repetition period;
means for measuring said time interval, said means for measuring being connected to said means for detecting; and
means for calculating the magnitude of selected ones of said parameters, said means for calculating being connected to both said means for detecting and said means for measuring;
wherein said selected parameter is pulse pressure and wherein the means for calculating calculates the pulse pressure in accordance with the expression:

$$P_{pi} = K\left(\frac{Q_i}{1 - Q_i}\right)$$

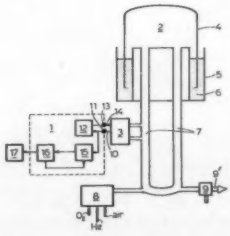
where
P_{pi}=pulse pressure as calculated with data obtained in said selected cycle of variation
K=calibration constant
$Q_i = Y'_{iV}/\Delta Y_i$
where
$Y'_{iV} = Y_{iV} - Y_{iMIN}$
Y_{iV}=the amplitude of said signal at the maximum value of said slope in said selected cycle of variation
Y_{iMIN}=said minimum amplitude in said selected cycle of variation;
$\Delta Y_i = Y_{iMAX} - Y_{iMIN}$
where
Y_{iMAX}=said maximum amplitude in said selected cycle of variation.

4,418,701

SYSTEM FOR DETERMINING THE VOLUME VALUE OF A CONFINED SPACE

Johannes G. T. Luijpers, Bunnik, Netherlands, assignor to Gould Medical B.V., Bilthoven, Netherlands

Filed Sep. 9, 1980, Ser. No. 185,552
Claims priority, application Netherlands, Sep. 14, 1979, 7906869
Int. Cl.³ A61B 5/08
U.S. Cl. 128—729 **12 Claims**



1. A system for measuring the volume of a confined space, in particular the functional residual capacity of the lungs of a patient, said system being of the type which includes a measuring space having a variable volume, means for selectively connecting the measuring space to the confined space, means

for supplying air to and removing air from as well as for supplying oxygen and a detectable gas to the measuring space, a gas analyzer for generating an output signal which is a linear function of the concentration of the detectable gas and which has an adjustable zero level, said system further comprising:

output adjustment means for selectively adjusting to zero the output signal of the gas analyzer before the detectable gas is supplied to the measuring space;

an adjusting device for equalizing the output signal of the gas analyzer with a reference voltage after the detectable gas has been supplied to the measuring space, said adjusting device being provided with a summing circuit, a first input of which is connected to the output of the gas analyzer, a second input of which is connected to the reference voltage and a third input of which is connected to an adjustable voltage, and output of the summing circuit being adjustable to zero by adjusting the adjustable voltage;

means for generating a system output signal after the measuring space has been brought into communication with the confined space, said generating means comprising an adjustable voltage divider connected to the output of the gas analyzer and providing an adjustable portion of the output signal of the gas analyzer to a fourth input of the summing circuit by means of an electrically switching element;

a display device connected to receive said output signal.

4,418,702

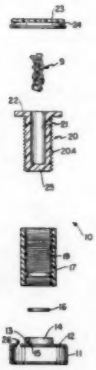
METHOD AND APPARATUS FOR COLLECTING SALIVA

Paul Brown, and Joseph O'Brien, both of Ridgewood, N.J., assignors to Metpath Inc., Teterboro, N.J.

Continuation-in-part of Ser. No. 224,306, Jan. 12, 1981, abandoned. This application Dec. 17, 1981, Ser. No. 331,890

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—760 **1 Claim**



1. An apparatus for collecting a volume of saliva as a specimen from a test subject, comprising,

(a) a collection vial for receiving saliva, said vial having an aperture at one end and a filter disposed across said aperture;

(b) a hollow cylindrical barrel having first and second ends, the first end of said barrel being connected to said vial in a manner such that the filter covers the opening of said first end of said barrel;

(c) a piston telescopically inserted into the second end of said barrel;

(d) a storage space in said piston, said space having a mass of saliva-absorptive material disposed therein; and

(e) a removable cap connected to said piston for enclosing said space.

4,418,703

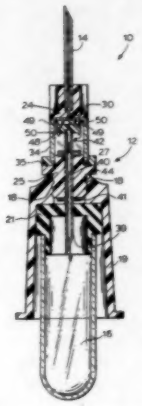
MULTIPLE SAMPLE NEEDLE ASSEMBLY

Louis Hoch, Nutley, and Lawrence Lutkowski, East Rutherford, both of N.J., assignors to Becton Dickinson and Company, Paramus, N.J.

Filed Jul. 30, 1981, Ser. No. 288,635

Int. Cl.³ A61B *5/14*

U.S. Cl. 128—766 **8 Claims**



1. A multiple sample needle assembly for determining vein entry when collecting blood samples from a patient comprising:

a housing having a forward end, a rearward end and a chamber within, said housing being translucent at least around the chamber so that said chamber is viewable by a user of said assembly;

a first cannula in fluid communication with said chamber extending outwardly from said forward end and adapted for insertion into a patient;

a second cannula positioned in said rearward end and slidable from a first position to a second position and having a first end portion extending outwardly from said rearward end and a second end portion opposite said first end portion and extending inwardly into said chamber the end of said second end portion being blocked;

an access opening in said second end portion providing flow communication between the lumen of said second cannula and said chamber; a plug of material in said rearward end of said chamber and tightly surrounding said second end portion for preventing liquid communication through said access opening when said second cannula is in said first position, but providing fluid communication between said chamber and the lumen of said second cannula through said access opening when said second cannula is in said second position inwardly displaced from said first position;

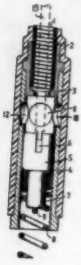
resilient means inside said chamber normally biasing said second cannula in an outward direction to said first position, said resilient means adapted to contract when said second cannula slides inwardly under an applied force to said second position, said resilient means adapted to urge said second cannula outwardly, when said applied force is removed, to said first position and

said plug of material being air pervious and liquid impervious.

4,418,704
INTRAVENOUS PACEMAKER ELECTRODE

Peter Theisen, and Klaus-Dieter Riechert, both of Berlin, Fed. Rep. of Germany, assignors to Biotronik Mess- und Therapiegeräte GmbH & Co. Ingenieurbüro Berlin, Berlin, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,477
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—785 **9 Claims**



1. In a pacemaker electrode including an axially open, hollow cylinder having a cylindrical wall; a plunger axially displaceably received in said cylinder and being substantially impervious to X-rays; a securing element for attaching said electrode to the heart; said securing element being mounted on said plunger for movement therewith; said securing element and said plunger having a withdrawn position in which said securing element is in a substantially fully retracted state within said cylinder; said securing element and said plunger having an advanced position in which said securing element projects from said cylinder; the improvement wherein said cylindrical wall comprises a first portion forming a path which is substantially pervious to X-rays and a second portion axially adjoining said first portion and being substantially impervious to X-rays; said plunger substantially blocking said path for X-rays through said first portion in a direction transverse to said cylinder when said plunger and said securing element are in said withdrawn position and said plunger being substantially clear of said path in said advanced position of said plunger and said securing element, whereby the position of said plunger with respect to said first portion being determinable by an X-ray monitor.

4,418,705
METHOD AND RELATIVE MANUFACTURING MACHINE FOR SIMULTANEOUSLY PRODUCING TWO CONTINUOUS CIGARETTE RODS

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Division of Ser. No. 149,000, May 12, 1980, Pat. No. 4,336,812. This application Dec. 14, 1981, Ser. No. 330,564
Claims priority, application Italy, May 22, 1979, 49133 A/69
Int. Cl.³ A24C *5/14, 5/18, 5/39*
U.S. Cl. 131—84 R **8 Claims**

1. A method for simultaneously producing two continuous cigarette rods, characterized by comprising two simultaneous successions of stages, the first for forming two equal strips (36) of paper starting from a single continuous web (7), and the second for forming two substantially uniform and equal fillers (57) of shredded tobacco starting from a single inlet hopper (68); said first succession comprising the following stages:

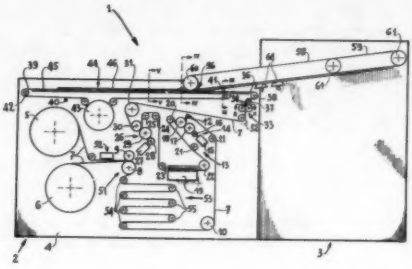
feeding said continuous paper web (7) along a determined path to a cutting position (33);

marking equal graphical signs on said web upstream of said cutting position (33) on each side of the longitudinal axis through the web (7);

longitudinally cutting said web at said cutting position (33) into two equal strips (36);

feeding said two strips (36) along separate paths through respective loading positions (56) at which a respective said filler (57) of shredded tobacco is fed on to each of said strips (36); and turning the opposing lateral edges of each of said strips (36) towards each other and then joining them together;

and said second succession comprising the following stages:



withdrawing the shredded tobacco from said hopper (68) in such a manner as to provide a continuous substantially uniform stream of tobacco;

dividing said stream into two substantially equal streams;

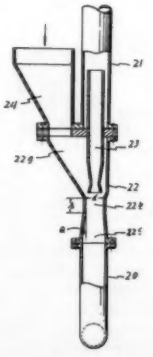
feeding each of said two streams to below a respective suction conveyor belt (58–59) to form said two uniform fillers (57) of shredded tobacco; and

feeding said two fillers to said respective loading positions (56).

4,418,706
METHOD FOR EXPANDING TOBACCO AND APPARATUS THEREFOR

Ki-Hwan Kim; Kwang-Keun Yoo, and Tae-Ho Lee, all of Seoul, Rep. of Korea, assignors to Office of Monopoly, Seoul, Rep. of Korea

Filed Sep. 21, 1981, Ser. No. 304,057
Int. Cl.³ A24B *3/18*
U.S. Cl. 131—296 **15 Claims**



1. A process for expanding tobacco stems with superheated steam which comprises:

preparing rolled, cut tobacco stems having a desired particle size and moisture content; supplying said stems into a U-shaped, tubular expansion device by means of a suction force produced by superheated steam being ejected down-

ward from a steam nozzle positioned in a venturi tube, said tube being present in position between the bottom end of a hopper for said stems and the upper end of the inlet of said expansion device;

subjecting momentarily said stems to the action of the steam pressure and heat to expand said stems to a certain extent in said expansion device;

exposing suddenly the expanded stems to an atmospheric pressure for further expansion; and

removing moisture from the mixture of said stems and steam by means of hot air flowing through the stream of said mixture.

4,418,707

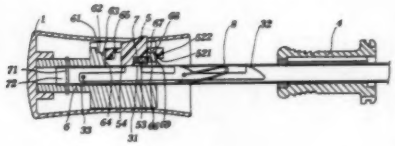
LOCKING DEVICE OF AN AUTOMATIC OPENING UMBRELLA

Tsun Z. Wu, No. 15, Lane 52, Ho-Ping West Rd., Section 3, Taipei, Taiwan

Filed Feb. 4, 1982, Ser. No. 345,587

Int. Cl.³ A45B *25/14*

U.S. Cl. 135—24 **8 Claims**



1. A locking device for an automatic opening umbrella comprising:

a seat housed within a handle of the umbrella, said seat having a recess communicating with an opening formed in said handle for receiving a button, and having a plurality of guide planes able to guide said button;

a button having an arm extending from each side thereof formed to fit with said guide planes;

an elastic spring interposed between the button and the seat;

a plate spring having an extension and a claw, said claw being coupled with a lower notch cylinder of the umbrella; and

said button and said plate spring being arranged to define under normal conditions a clearance between the bottom of said button and the top of said extension of said plate spring;

whereby on application of a force in the forward and downward direction against the longitudinal axis of the umbrella, said arms of the button will be moved along said guide planes of said seat and thereafter depress the extension of said plate spring to produce a pivotal rotation therein so as to disengage the retaining claw from said lower notch cylinder.

4,418,708

TWO-DIMENSIONAL, UNILATERAL OBLIQUE SHOCK DIFFUSER AS THE AIR INLET FOR A GAS TURBINE JET ENGINE FOR THE PROPULSION OF HEAVY-DUTY AIRCRAFT

Carsten Schulze, Götting; Kurt Lotter, Riemerling, and Jakob Malefakis, Putzbrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Ottobrunn, Fed. Rep. of Germany

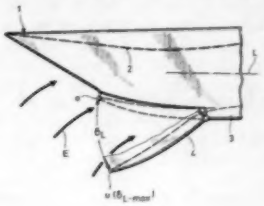
Filed Feb. 24, 1981, Ser. No. 239,021

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009340

Int. Cl.³ F02C *7/042*

U.S. Cl. 137—15.2 **1 Claim**

1. Two-dimensional, unidirectional oblique air impact diffuser as an air inlet for a gas turbine jet engine for the propulsion of a high-performance aircraft operationable in the subsonic, transonic, and supersonic ranges, comprising a rigid upper air inlet ramp forming the upper side of the air inlet, said air inlet ramp having a leading edge facing in the direction of flight, an air inlet bottom spaced downwardly from said air inlet ramp and forming the lower side of the air inlet, said air inlet bottom having a leading edge facing in the direction of flight and spaced rearwardly of the leading edge of said air inlet ramp, characterized by an air scoop lip (4) pivotally attached to the leading edge of said air inlet bottom and extending in the direction toward the leading edge of said air inlet ramp with the leading edge of said air scoop lip spaced



between the leading edge of said air inlet ramp and said air inlet bottom, said air scoop lip having a standard setting point with the surface of said air scoop lip forming an aligned continuation of said air inlet bottom, in the range of subsonic and transonic operation said air scoop lip is pivotally displaceable downwardly away from said air inlet ramp to a maximum angle from the standard setting point in the range of 30° and 50° and in the range of supersonic operation said air scoop lip is pivotally displaceable closely upwardly toward said air inlet ramp from the standard setting point, and the position of said air scoop lip relative to the standard setting point is determined as a direct function of the aircraft angle of attack and as an inverse function of the flight Mach number.

4,418,709

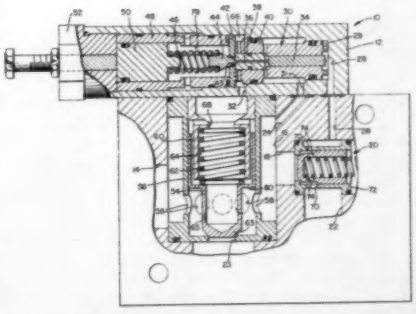
UNLOADING VALVE FOR HI-LO-HYDRAULIC SYSTEM

Arthur E. Hirsch, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Nov. 19, 1981, Ser. No. 323,001

Int. Cl.³ G05D *16/10*; F16K *17/20*

U.S. Cl. 137—115 **1 Claim**



1. An unloading valve for satisfying the requirements of a hydraulic system while minimizing transient pressure fluctuations,

the unloading valve including a valve body having an inlet port connected to a pump for receiving the fluid output of the pump, an intermediate relief chamber within said valve body connected to said inlet port, and check valve means for

permitting the full fluid flow from said pump to pass through a discharge port in said valve body to said hydraulic system;

a locking spool slidably mounted within a sleeve in said valve body, fluid pressure from said hydraulic system being communicated into a first fluid chamber adjacent one end of said locking spool within said valve body for causing it to operate against an unloading pin, said unloading pin mounted within a mounting plug, an orifice plate mounted in the valve body adjacent to the unloading pin with an opening through the orifice plate being closed by a spring biased unloading poppet having an end seated within said opening, the cross-sectional area of said unloading pin being uniform and relatively small compared to the cross-sectional area of said unloading poppet, and fluid pressure from said intermediate relief chamber being communicated into a second fluid chamber adjacent the opposite end of said locking spool for holding said locking spool in a first position until the hydraulic system pressure reaches a predetermined unload pressure value;

a relief poppet mounted within said intermediate relief chamber of the valve body, said relief poppet being spring biased towards a seated position within a drainage port, fluid pressure being communicated between the interior of said relief poppet and a third fluid chamber between said mounting plug and said seated end of said unloading poppet, said first, second and third fluid chambers being located on one side of said orifice plate and said unloading poppet being located on the opposite side of said orifice plate; and

said unloading poppet being unseated when the pressure in the hydraulic system exceeds the spring force against the unloading poppet thereby permitting pilot flow to a reservoir, a further increasing system pressure resulting in the unseating of said relief poppet thereby permitting flow through said drainage port to said reservoir until all the fluid entering said inlet port being discharged to said reservoir, the hydraulic system pressure upon reaching said predetermined unload pressure value causing said locking spool to shift from said first position against said unloading pin and unloading poppet until said unloading poppet is fully opened and said relief poppet is moved away from its seat to the limit of its travel, and a reduction of system pressure below said predetermined unload pressure value resulting in the reloading of the valve and shifting of said locking spool back to its first position until the pressure in said system again rises to said unload pressure.

4,418,710

PILOT CONTROL VALVE FOR LOAD SENSING HYDRAULIC SYSTEM

Oliver W. Johnson, Chaska, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 5, 1981, Ser. No. 308,347

Int. Cl.³ F15B *13/06*

U.S. Cl. 137—117 **5 Claims**

1. A flow control arrangement for use in a system including a fluid source having an output flow which is variable in response to changes in pressure in a load signal chamber and a flow path, including a flow orifice, connected in series flow relation with the fluid source, said flow control arrangement comprising:

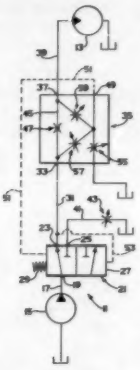
(a) a valve housing defining a valve bore, a feed passage in fluid communication with the flow path, upstream of the flow orifice, a load passage in fluid communication with the flow path, downstream of the flow orifice, a load signal passage in fluid communication with the load signal chamber, and a drain passage in fluid communication with the system drain, said feed, load, load signal, and drain passages being in fluid communication with said valve bore; and

(b) a movable valve member disposed in said valve bore and having a plurality of control positions, including:

(i) a first position providing a fluid communication between said drain passage and said load signal passage while blocking communication through said feed and load passages;

(ii) a second position providing simultaneous fluid communication between said load signal passage and said drain and load passages while blocking communication through said feed passage;

(iii) a third position providing communication between said load signal passage and said load passage while blocking communication through said drain and feed passages;



(iv) a fourth position providing simultaneous fluid communication between said load signal passage and said load and feed passages while blocking communication through said drain passage; and

(v) a fifth position providing fluid communication between said load signal passage and said feed passage while blocking communication through said drain and load passages.

4,418,711

VALVE INSERT AND VALVES DESIGNED THEREWITH

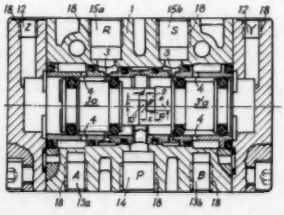
Kurt Stoll, Esslingen, and Manfred Rüdle, Esslingen-Berkheim, both of Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 246,966

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3011791

Int. Cl.³ F15B *13/042*

U.S. Cl. 137—269 **7 Claims**



1. In a five-way slide valve device which includes a valve casing having a bore therein, a sleeve which is fixedly arranged in said bore in said valve casing, is open at its ends, and has several radial openings therethrough which are separated by first annular seals provided around said sleeve and sealingly engaging said sleeve and casing, said radial openings communicating with respective bores provided in said valve casing, and a slide valve axially slidably supported in said sleeve and having second annular seals therearound which are movable therewith and sealingly engage said sleeve and said slide valve, wherein one said radial opening is a pressure medium inlet and

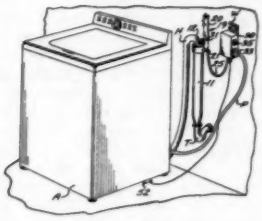
said slide valve device is symmetric about a radial plane which contains said pressure medium inlet, the improvement comprising wherein said sleeve and said slide valve each include two identical parts which are arranged in mirror-image relationship with respect to said radial plane which contains said pressure medium inlet, said slide valve parts each having a hook on the end thereof adjacent the other slide valve part, said hooks being identical and said slide valve parts being releasably connected by said hooks, said hooks having means for substantially preventing relative axial movement between said slide valve parts but permitting relative radial movement therebetween.

4,418,712

OVERFLOW CONTROL SYSTEM

Charles A. Braley, P.O. Box 3960, Torrance, Calif. 90510

Division of Ser. No. 112,641, Jan. 16, 1980, Pat. No. 4,380,243.
This application Jun. 13, 1981, Ser. No. 282,499
Int. Cl.³ H01H *35/18, 29/06*
U.S. Cl. 137—312 **1 Claim**



1. In an applicance adapted to be powered by an electrical outlet and conformed to receive from a water supply predetermined amounts of water at automated first intervals and to drain into a drainage system said amounts of water at automated second intervals, the improvement comprising:

a stand pipe interposed between said appliance and said drainage system and aligned in a substantially vertical direction above said drainage system, for conveying said amounts of water therethrough;

a displacement weight suspended in said stand pipe from a spring loaded switch and conformed to articulate said switch upon immersion in water for producing a switching signal indicative of the collection of liquids in said standpipe above a selected level;

interrupting means interposed between said appliance and said electrical outlet and connected to receive said switching signal for disrupting the receipt of electrical power upon the occurrence of said switching signal; and

moisture sensing means deployed subjacent said appliance and connected in parallel with said switching signal for disrupting said electrical power upon the leakage of water thereupon.

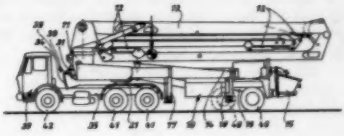
4,418,713

CONCRETE PUMP TRACTOR TRAILER ASSEMBLY

Karl Schlecht, Hainbuchenweg 47, 7000 Stuttgart 70, Fed. Rep. of Germany

Filed Apr. 27, 1981, Ser. No. 257,856
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016232
Int. Cl.³ B62D *53/06;* **E04G** *21/04*
U.S. Cl. 137—351 **14 Claims**

1. A vehicular concrete pumping rig for conveying concrete at a construction site comprising: a semitrailer; extendable support means for bracing said semitrailer at a ground location; an articulated concrete distribution pole including a concrete line for distribution of concrete; means operably mounting said distribution pole on said semitrailer rotatably about a generally vertical axis; concrete pump means on said semitrailer for pumping concrete to said concrete line; a truck tractor for driving said semitrailer; coupling means interconnecting said semitrailer and said tractor; and raising and securing means on said semitrailer for elevating said truck tractor and supporting it in a raised position while said semitrailer is braced by said extendable support means thereby to enable utilization of said raised truck tractor as ballast to stabilize said semitrailer against the weight of said distribution pole, said raising and securing means comprising at least one pulling member located



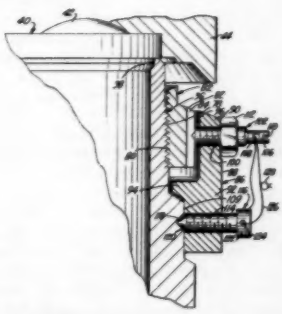
forwardly of said coupling means taken in the driving direction of said rig, said pulling member being adapted to be fastened between said semitrailer and at least one location on said truck tractor, said location being situated lower than said semitrailer, said truck tractor being thereby adapted to be raised entirely off the ground with front and rear wheels thereof when said coupling means is engaged and when said extendable support means are extended.

4,418,714

BLOW DOWN RING LOCKING DEVICE

Eugene C. Cullie, Tappan, N.Y., assignor to Teledyne Farris Engineering, Palisades Park, N.J.

Filed Jun. 24, 1981, Ser. No. 276,934
Int. Cl.³ F16K *17/20*
U.S. Cl. 137—478 **7 Claims**



1. A safety relief valve comprising:

(a) a valve housing;

(b) a nozzle enclosed within said housing, said nozzle having external threading;

(c) a blowdown ring threaded to said nozzle, said blowdown ring including serrations;

(d) means disposed about the top of said nozzle to maintain said nozzle closed until a predetermined pressure is reached within said nozzle and to open said nozzle thereafter;

(e) a collar disposed about said blowdown ring and said nozzle and enclosed within said valve body, said collar having a first section proximate said blowdown ring, said collar having a second section proximate said nozzle;

(f) position securing means disposed at said first section of said collar for being releasably disposed between the serrations of said blowdown ring to prevent said blowdown ring from being turned; and

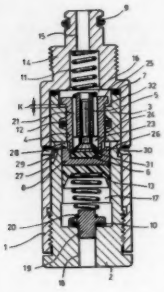
(g) fastening means disposed at said second section of said collar for fixing said collar to said nozzle.

4,418,715

PRESSURE LIMITING VALVE, PARTICULARLY FOR HYDRAULIC MINE PROPS

Karoly Balazs, Budapest, Hungary; Vladislav D. Firstov, Moscow, U.S.S.R.; Miklos Freska, Budapest, Hungary; Laszlo Gal; Sandor Hlavay, both of Balassagyarmat, Hungary; Lajos Huber, Budapest, Hungary; Jozsef Korbuly, Budapest, Hungary; Laszlo Mahig, Budapest, Hungary, and Juri F. Ponomarenko; Juri G. Shein, both of Moscow, U.S.S.R.; Ferenc Simon, Budapest, Hungary, assignors to Központi Banyaszati Fejlesztesi Intezet; Magyar Aluminiumipari Troszt, both of Budapest, Hungary and Skotchinsky Institut Gornogo Dela, Moscow, U.S.S.R.

Filed Aug. 12, 1981, Ser. No. 292,195
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—508 **4 Claims**



1. A pressure limiting valve comprising:

an elongated housing having an axially spaced apart high pressure fluid inlet opening and a fluid outlet opening;

a flat valve seat axially displaceable in said housing and disposed between said inlet and outlet openings;

a first chamber formed in said housing on one side of said valve seat and provided with an inlet passage for the introduction of a pressurized gas into said first chamber, said inlet passage being provided with a spring-loaded closure member for retaining said pressurized gas within said first chamber to act against said valve seat;

a first limitedly axially displaceable valve member provided on the other side of said valve seat from said first chamber between said seat and said inlet opening, said first valve member being formed with an annular axial flange portion biased against said valve seat in an outlet blocking position by a spring bearing against said first member, said annular axial flange defining with said valve seat a second chamber, said second chamber communicating with said inlet opening through a plurality of axial passageways formed in said first valve member; and

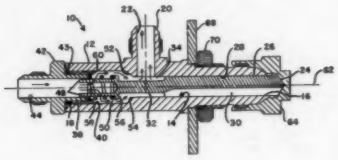
a second axially displaceable valve member guided in said first member and having a frustoconical head disposed in said second chamber concentrically with said annular axial flange, said head having a flat end engageable with said valve seat for displacing same against the force of the pressurized gas in said first chamber out of engagement with said first valve member to unblock said outlet opening for enabling high pressure fluid to flow from said inlet opening to said outlet opening.

4,418,716

TWO-WAY FLOW VALVE

Roy R. Starke, Lake Park, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 10, 1981, Ser. No. 291,863
Int. Cl.³ F16K *11/00*
U.S. Cl. 137—605 **3 Claims**



1. A two-way flow valve, comprising:

(a) a generally hollow valve body having first and second internal cylindrical surface portions defining a cavity open at both ends and an outlet port from said cavity located intermediate its ends, said first cylindrical surface portion extending from said outlet port to one end of said cavity;

(b) a valve stem having a body portion which is generally cylindrical in shape and movably mounted within said cavity for longitudinal sliding engagement with said first cylindrical surface portion of said valve body, said stem body portion having a longitudinally-extending segment thereof which is cut away so as to define a first inlet port at one of said cavity ends, said valve stem also having a recessed neck portion merging from said body portion and located adjacent said outlet port in said valve body, said recessed neck portion of said valve stem and said first cylindrical surface portion of said valve body together defining therebetween a first fluid flow path through said first inlet port to said outlet port;

(c) means defining a second inlet port at the other of said cavity ends;

(d) said valve stem further having a pair of parallel, longitudinally-extending tabs merging from said recessed neck portion to adjacent said second inlet port, said tabs of said stem and said second cylindrical surface portion of said valve body together defining therebetween a second fluid flow path through said second inlet port to said outlet port;

(e) means encircling said tabs of said valve stem and mounted within said valve body cavity for biasing said stem to move toward a first position in which said fluid flow along said second flow path is obstructed, while fluid flow along said first flow path is allowed; and

(f) means for closing said first inlet port and thereby obstructing fluid flow along said first flow path, said means when closing said first inlet port also causing said stem to move to a second position against said biasing means in which fluid flow along said second path is allowed.

4,418,717

MODULAR PRESSURE LETDOWN VALVE

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

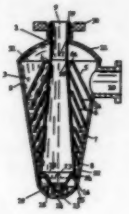
Continuation-in-part of Ser. No. 55,470, Jul. 6, 1979, Pat. No. 4,270,571. This application Dec. 8, 1980, Ser. No. 213,932
Int. Cl.³ F16K *47/04*
U.S. Cl. 137—614.2 **10 Claims**

1. A modular pressure letdown valve comprising:

a valve housing with a bore passing therethrough having fluid supply and exhaust port means incorporated therein including two concentric sets comprising a plurality of circular dished baffles spaced detacheably inside said bore in an interjacent relationship so as to accomplish throttling

of high pressure fluid entering said bore via said fluid supply port means to exit at substantially lower pressure via said fluid exhaust port means after flowing over said plurality of said baffles arranged so as to provide an alternating valve and baffle flow structure with a multitude of flow reversals,

a coaxial central tube delivering said fluid from said fluid



supply port meas adjacent a first bore end of said housing for discharge therefrom into said baffles adjacent a second bore end of said housing,

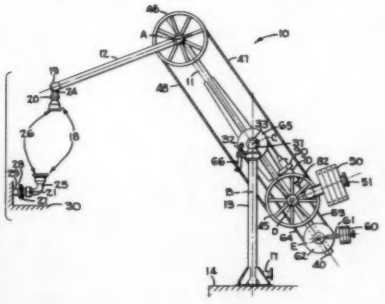
said circular baffles alternatingly secured to said housing bore and said central tube both tapered in opposite directions so as to have a first set sealing on said bore while a second set is sealing on an outside diameter of said central tube.

4,418,718

METHOD AND APPARATUS FOR CONTROLLING ARTICULATED FLUID LOADING ARMS UPON EMERGENCY DISCONNECTION

Joel L. Fusy, Sens, France, assignor to FMC Corporation, Chicago, Ill.

Filed Jul. 15, 1981, Ser. No. 283,584
Claims priority, application France, Jul. 28, 1980, 80 16565
Int. Cl.³ B65B *3/04*
U.S. Cl. 137—615 **7 Claims**



1. An articulated loading arm for transferring fluid from one fluid handling means to another and for quickly moving the outer end of the loading arm away from an adjacent handling means during an emergency disconnection, said arm comprising:

an inner arm member;

means mounting said inner arm member for pivotal movement about a first horizontal axis;

an outer arm member pivotally connected at one of its ends to the outer end of said inner arm member for movement about a second horizontal axis;

a primary counterweight pivotally mounted on a support fixed to and extending rearwardly from said inner arm member, said primary counterweight coupled to said outer arm member to counterbalance said loading arm about said first horizontal axis and said outer arm member about said second horizontal axis;

an auxiliary counterweight pivotally mounted on said support to confine elevational movement of the outer end of said loading arm in a safe path upon emergency disconnection thereof from said adjacent fluid handling means;

means for transferring the moment generated by said auxiliary counterweight from said support to said mounting means; and

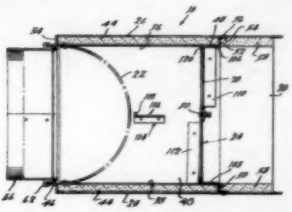
control means cooperating with said transferring means and said mounting means for controlling pivotal movement of said auxiliary counterweight with respect to said support.

4,418,719

AIR CONTROL APPARATUS

Edward T. Downs, Jr., 5873 Trotter La., West Bloomfield, Mich. 48033, and Julius Komorek, 15658 Williams, Livonia, Mich. 48154

Filed Nov. 26, 1980, Ser. No. 210,848
Int. Cl.³ F16K *47/14*
U.S. Cl. 137—625.31 **15 Claims**



1. An air distribution apparatus for providing and controlling a supply of conditioned air to one or more spaces, said apparatus comprising:

an air receiving chamber having an inlet and an outlet spaced from said inlet, said chamber having a cross sectional size substantially larger than the cross section of said inlet and including a pair of spaced substantially parallel wall portions, a pair of spaced sidewall portions extending between said parallel wall portions;

control means within said chamber operative to control air flow from said inlet to said outlet, said control means being pivotably supported about a laterally extending axis positioned approximately midway between said wall portions; and

diffusion means positioned within said chamber between said inlet and said control means, said diffusion means comprising an arcuate perforated member extending between said wall portions and having a concave surface facing said inlet whereby said diffusion means may operate to distribute air flow from said inlet over substantially the entire transverse cross sectional area of said chamber with a maximum velocity air flow rate extending laterally approximately midway between said wall portions so as to facilitate control of said air flow to said outlet by said control means.

4,418,720

SOLENOID OPERATED DIRECTIONAL VALVES HAVING MODULAR CONSTRUCTION

Curtis H. Day, Manchester, and Ronald L. Loup, Clarkston, both of Mich., assignors to Double A Products Company, Manchester, Mich.

Filed Mar. 6, 1981, Ser. No. 241,355
Int. Cl.³ F15B *13/044*
U.S. Cl. 137—625.65 **17 Claims**

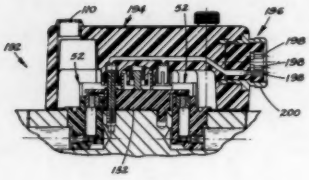
8. In a solenoid operated directional valve comprising a

valve assembly and a solenoid assembly assembled together, said valve assembly including a valve body and electrical means thereon via which energizing current for said solenoid assembly flows, an improved electrical connection between said solenoid assembly and said electrical means for effecting electrical connection of said solenoid assembly to said electrical means integral and concurrent with the act of moving the two assemblies along a given direction into assembly with each other comprising;

at least one electrically conductive terminal on said solenoid assembly via which energizing current for the solenoid assembly flows;

at least one electrically conductive terminal on said valve assembly each of which corresponds to and is mated with a corresponding one of said terminals on said solenoid assembly;

each such pair of mated terminals comprising mated elongate portions which are elongate in the direction via which the two assemblies are moved into assembly with each other;



one terminal of each such pair of mated terminals being mounted on an electrcially non-conductive terminal block which is mounted on the corresponding assembly;

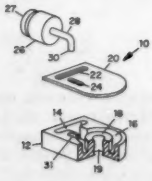
said one terminal of each such pair comprising a strip one lengthwise end of which is fixedly mounted on the terminal block and the opposite lengthwise end of which is free and curled to form the elongate portion of said one terminal with the direction of elongation being transverse to the length of said strip, said strip including a compliant portion between said ends thereof which permits limited movement of its free end relative to its fixed end whereby the elongate portions of each such pair of terminals are readily mated during assembly of the solenoid assembly and valve assembly and are rendered substantially immune to relative movement when the valve is in use.

4,418,721

FLUIDIC VALVE AND PULSING DEVICE

Allen B. Holmes, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 12, 1981, Ser. No. 273,170
Int. Cl.³ E21B *47/12*; G01V *1/40*
U.S. Cl. 137—810 **13 Claims**



1. Means for controlling the flow of a fluid comprising essentially,

a vortex chamber having a radial inlet thereto for said flow, and a centrally located outlet from said chamber, whereby flow into said chamber flows radially to said outlet, and

a movable barrier within said vortex chamber for selectively altering said flow from radial to vortical within said chamber;

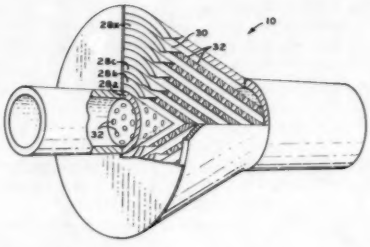
wherein said movable barrier comprises a tab within said vortex chamber, said vortex chamber comprising a recess in a peripheral wall thereof, and said tab is movable between a first position located within said recess and a second position in said chamber exterior of said recess.

4,418,722

PRESSURE LETDOWN METHOD AND DEVICE FOR COAL CONVERSION SYSTEMS

James M. Kendall, Pasadena, and John V. Walsh, Glendora, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 30, 1981, Ser. No. 259,211
Int. Cl.³ G05D *16/00*
U.S. Cl. 138—42 **2 Claims**



1. In combination with a source of polyphase fluid having a discharge outlet for discharging a stream of fluid characterized by a first pressure greater than a second pressure and flowing at a substantially constant flow rate, a pressure letdown device for dropping the pressure of the fluid, comprising in combination:

A. means defining in said device an intake port, a discharge port, and a flow path extending between said ports for a stream of fluid flowing at a constant rate, said flow path being caused to communicate with said discharge outlet via said intake port for accepting said stream of fluid at the intake port and for causing the stream to flow at a constant velocity along said flow path from said intake port to said discharge port; and

B. pressure dropping means disposed in said flow path for dropping the pressure of the fluid without reducing the velocity thereof, as the stream is caused to flow between said intake and discharge ports;

said pressure dropping means including a series of pressure letdown stages including a plurality of baffles of similar conical configurations disposed in coaxially nested alignment, and means defining in each of said baffles a plurality of apertures of uniform dimensions, the number of apertures for each baffle of said plurality of baffles being unique with respect to the number of apertures for each of the other baffles of said plurality.

4,418,723

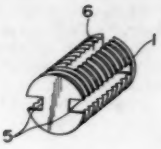
FLOW RESTRICTOR

Tsuyoshi Koni, and Yoshihisa Urushida, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1981, Ser. No. 289,243
Claims priority, application Japan, Aug. 12, 1980, 55-110747
Int. Cl.³ F15D *1/00*; G01F *1/40*
U.S. Cl. 138—42 **3 Claims**

1. A flow restricter for use in a flowmeter utilizing pressure

drop caused by laminar flow comprising a cylindrical member, and a housing having a fluid inlet and a fluid outlet for accommodating said cylindrical member comprising at least one groove disposed spriral in the peripheral direction of the cylindrical surface thereof, at least one endless inlet channel, at least



one endless outlet channel in the longitudinal direction thereof and end plates secured to the ends thereof, one of said plates having at least one inlet opening corresponding to said at least one endless inlet channel and the other of said plates having at least one outlet opening corresponding to said at least one endless outlet channel.

4,418,724

HEAT INSULATING CASING

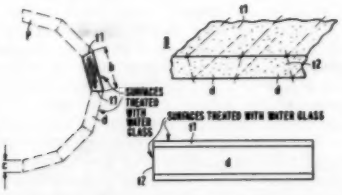
Wolfgang-Peter Fricker, Freinsheim, and Manfred Scholz, Erlangen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr and Grünzweig & Hartmann Montage GmbH, Ludwigshafen, both of, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,565

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014453; Mar. 10, 1981, 3049871

Int. Cl.³ F16L *59/14*

U.S. Cl. 138—149 **15 Claims**



1. Heat insulating casing for structural components having curved surfaces, comprising insulating plates formed of compressed material based on pyrogenic silica, reinforcement fibers and an opacifier, said insulating plates being divided into insulating elements having trapezoidal cross sections, said insulating elements being combined to form a polygonal insulating shell, said polygonal insulating shell being in the form of a tubular heat insulating casing for insulating structural components having substantially cylindrical peripheries, said shell being divided into at least two half-shell casing parts defining parting gap regions and including an inner steel shell, ring-shaped end plates, an outer steel shell, and a moisture-proof connection between said outer shell, inner shell and end plates.

4,418,725

HOOK FOR JACQUARD MACHINE

Pierre Mouterde, Le Cartallet - Eyzin Pinet, 38780 Pont Eveque, and Ulrich Mutschler, 41A rue Pasteur, 69300 Caluire, both of France

Filed Nov. 3, 1981, Ser. No. 318,073

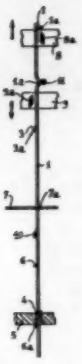
Claims priority, application France, Nov. 3, 1980, 80 23665

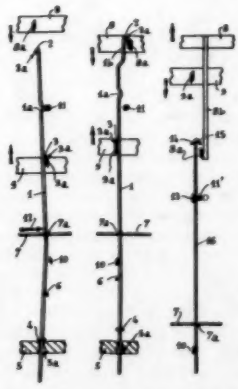
Int. Cl.³ D03C *3/00*

U.S. Cl. 139—59 **7 Claims**

1. An improved hook mechanism for a double-lift open shed Jacquard machine of the type having upper and lower frames reciprocated vertically in opposition to one-another and respectively having grippers for engaging catches on the hooks for raising the hooks to raised positions, the machine having Jacquard needles extending across the hooks and respectively operative to displace the hooks laterally to select engagements of the grippers with the catches to control the weaving pattern, the hooks normally resting in their low positions on a bottom board having perforations for receiving the lower ends of the hooks, the improvements wherein:

(a) each hook comprises a linear rod extending vertically through a needle and having a lower end extending through a perforation in the bottom board and having a stop operative to support the hook in said low position, the hook having a first catch near the top of the rod and having a second catch on the opposite side of the rod, and





the hook having a laterally offset boss located below the first catch and extending away from the rod in the plane of the catches; and

(b) the machine having finger means extending laterally across the hooks at the level of their bosses when the hooks are in low position, and the finger means engaging the boss of a hook in low position and orienting the hook such that, in cooperation with the press of an associated needle in one direction or in the opposite direction, one of the first or second catches of said hook will be offset with respect to a gripper of an associated one of the frames and not raised thereby and the other catch of the hook will be oriented to be engaged by an associated gripper of the other frame, the bosses being so located with respect to said finger means that engagement therebetween occurs

only in said low position when the stops of the hooks are resting on the bottom board.

4,418,726

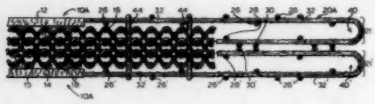
DOUBLE LOOP SEAM FOR CORRUGATOR BELTS

Michael J. Josef, Clifton Park, N.Y., and Joseph D. Lanthier, Watervliet, N.Y., assignors to Albany International Corp., Menands, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,148

Int. Cl.[3] D03D *25/00*; D21F *1/12*, *7/10*

U.S. Cl. 139—383 A 1 Claim



1. A seam construction joining together two ends of a multilayered corrugator belt fabric, which comprises;

a first end and a second end of a multilayered corrugator belt fabric, said multilayers including an upper layer and a lower layer, said ends each having an upper and a lower step therein by absence of portions of said upper and lower layers, each step being of a size adapted to mate with a corresponding step in a fabric seam-half connector described below;

a first fabric seam-half upper connector attached to the first end upper step, second fabric seam-half upper connector attached to the second end upper step,

a first fabric seam-half lower connector attached to the first end lower step, and a second fabric seam-half lower connector attached to the second end lower step,

said connectors each containing first, second and third warp systems and a single filling system, the first and second warp systems respectively providing with the filling, face and back weaves, the face weave covering the back weave for a portion thereof providing a double layer zone of an outer layer and an inner layer and the third warp system binding the face and back weaves together in the double layer zone, and the filling system woven in the folded position along an edge to enable said face weave to cover said back weave and to form alternately displaced protruding loops along said edge for intermeshing with like loops formed along the edge of the other of the first and second seam-half connectors attached to a corresponding step for receipt of a pintle through the intermeshed loops, each of the seam-half connectors having a step therein along the side opposite to the protruding loops, said step being effected by the absence of a portion of said inner layer of the double layer zone, each seam-half connector step being of a size adapted to mate with a corresponding step in one of the ends;

said seam-halves being joined by a pintle through the intermeshed loops of each of the upper and lower connectors;

the upper step of the first end being joined to the opposite step of the first fabric seam-half upper connector, the upper step of the second end being joined to the opposite step of the second seam-half upper connector, the lower step of the first end being joined to the opposite step of the first fabric seam-half lower connector and the lower step of the second end being joined to the opposite step of the second fabric seam-half lower connector;

said seam construction having a thickness about equal to the thickness of the corrugator belt fabric.

4,418,727

WEFT INSERTION DEVICES ON LOOMS HAVING A MOTIONLESS WEFT RESERVE

Nicola Santucci, Schio, Italy, assignor to Nuovo Pignone S.p.A., Firenze, Italy

Continuation-in-part of Ser. No. 259,978, May 4, 1981, which is a continuation of Ser. No. 145,039, Apr. 30, 1980, which is a continuation of Ser. No. 26,313, Apr. 2, 1979, which is a continuation of Ser. No. 901,790, May 1, 1978, which is a continuation of Ser. No. 725,345, Sep. 21, 1976. This application Jul. 1, 1981, Ser. No. 279,321

Claims priority, application Italy, Oct. 3, 1979, 27952 A/75

Int. Cl.[3] D03D *47/18*

U.S. Cl. 139—448 3 Claims

1. A pair of pincers for looms having a stationary weft reserve and shift of the wefts in the middle of the warp shed in which the leading pincer of said pair of pincers is formed by a boxlike member shaped in the front portion for receiving high speed input of the weft arranged diagonally of said pincer and for smooth and bumpless sliding of the warp threads and having milled on a side wall, a narrow longitudinal slot the lower plane of which is a rigid plane for grasping the weft and on which rests one weft-clamping blade of semi-rigid structure and curved upwardly away from said rigid plane at the forward end of said blade and affixed at the rear end of said blade to the pincer body and pressed at its top and adjacent its two side edges by a spaced pair of leaf springs each spring of said pair of springs being independent of the other spring of said pair and being independently loaded, the first of said springs applying a pressing force to one side edge of said blade adjacent the curved forward end of said blade, the other of said springs applying a pressing force to the other side edge of said blade and spaced along said blade rearwardly to the point where the force of said first spring is applied to said blade so that the longitudinal load diagram between the blade and the grasping plane applied by said pair of leaf springs is adjusted by said independent loading of said leaf springs, the drawing pincer of said pair of pincers including a lower fixed branch and a hook-carrying movable branch pivotal mounted on said drawing pincer and urged by a sturdy spring into pivotal engagement at one of its ends with a specially provided abutment of the fixed branch for locking engagement therewith during grasping and transfer of the weft, the fixed branch having at the front portion of said abutment a short and lightweight resilient portion terminated by a narrow and lightweight widening portion having a lower grasping surface urged towards the corresponding grasping surface of the hook by a resilient blade of which it is a part and which is depressed by insertion of the weft.

4,418,728

WEFT THREAD-STORAGE APPARATUS FOR A LOOM, ESPECIALLY A GRIPPER LOOM

Anton Lucian, Arbon, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Nov. 9, 1981, Ser. No. 319,807

Claims priority, application Switzerland, Dec. 17, 1980, 9297/80

Int. Cl.[3] D03D *47/36*

U.S. Cl. 139—452 8 Claims

1. A weft thread-storage apparatus for a loom, especially a gripper loom, comprising:

a storage for the temporary storage of a weft thread which is to be inserted into a weaving shed;

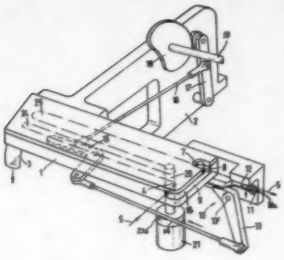
means defining a source of suction air with which there can be connected said storage;

said storage having an end region which is open practically

over its entire width and possesses a substantially slot-shaped configuration defining a slotted opening;

a substantially central loop divider for laying adjacently situated and mutually parallely extending partial thread loops;

said loop divider being arranged in an internal space of said storage at the neighborhood of said slotted opening;



said loop divider comprising a motor-driven roll having a rotational axis;

the rotational axis of said roll extending substantially perpendicular to a base surface of said storage; and

the direction of rotation of said roll corresponding to an infeed direction of the thread into said storage.

4,418,729

SHUTTLELESS LOOM WEFT DETAINING DEVICE

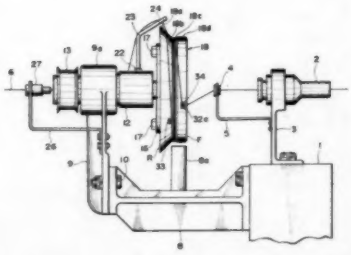
Yoshiharu Chiba; Hidetsugu Umezawa; Takao Sakabe, and Ryuji Arai, all of Mitaka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 2, 1981, Ser. No. 326,568

Claims priority, application Japan, Dec. 11, 1980, 55-173748

Int. Cl.³ D03D *47/36*

U.S. Cl. 139—452 **13 Claims**



1. A weft detaining device of a shuttleless loom having a weft inserting means, comprising:

a drum around which a weft yarn is wound prior to its introduction to the weft inserting means, said drum including

a first frustoconical section tapered generally toward the weft inserting means,

a first cylindrical section integral with said frustoconical section at the smallest diameter part,

a projecting section radially and outwardly projecting over the radial level of said first cylindrical section, said projecting section being spaced from said first frustoconical section in the axial direction of said drum, and

a connecting section integral with said projecting section to connect the radial top level of said projecting section with the radial level of said cylindrical section, said connecting section being located to leave said first cylindrical section between it and said first frustoconical section; and

means for catching the weft yarn in association with the peripheral surface of said drum to detain a predetermined length of the weft yarn on the drum peripheral surface prior to a weft picking through the weft inserting means.

4,418,730

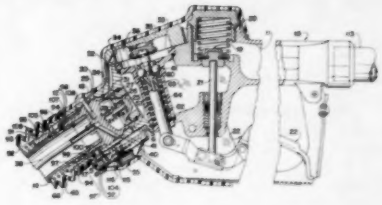
AUTOMATIC SHUT-OFF NOZZLE WITH VAPOR RETURN SEAL

Jack A. McMath, Fort Thomas, Ky., assignor to Dover Corporation, N.Y.

Continuation of Ser. No. 197,630, Oct. 16, 1980, abandoned, which is a continuation of Ser. No. 59,970, Jul. 23, 1979, abandoned, which is a continuation of Ser. No. 943,326, Sep. 18, 1977, abandoned, which is a continuation of Ser. No. 856,108, Nov. 30, 1976, abandoned, which is a continuation of Ser. No. 66,441, May 7, 1976, abandoned. This application Mar. 12, 1982, Ser. No. 357,692

Int. Cl.³ B65B *3/18*

U.S. Cl. 141—207 **8 Claims**



1. An automatic shut-off dispensing nozzle, comprising:

(a) a body, said body having an inlet and an outlet and an internal flow passage therebetween;

(b) a flow control valve disposed in said internal flow passage for controlling flow of liquid from said inlet to said outlet;

(c) manually operated means for controlling the operation of said flow control valve, said manually operated means being movably secured with respect to said body;

(d) a spout secured to said outlet of said body and having its free end for disposition into an opening of a fill tank of a vehicle tank or the like, said spout being in fluid communication with said internal flow passage to receive liquid discharged from said outlet;

(e) means for selectively releasing said manually operated means in response to predetermined conditions to allow closing of said flow control valve and stoppage of liquid flow through said internal passage immediately of said manually operated means, said releasing means including a venturi proximally disposed with respect to said internal flow passage and an air passage in gaseous communication between said venturi and an opening in said spout;

(f) a vapor return passage for returning vapor from a vehicle tank or the like when said spout is disposed in the vehicle tank's fill pipe;

(g) means for establishing a seal between the fill tank opening and the vapor return passage when said spout is inserted into the fill pipe opening;

(h) a divided housing secured to said body, said divided housing including a first chamber in open gaseous communication with the opening in said spout, a second chamber in open gaseous communication with said venturi, a third chamber in selective gaseous communication with said first and second chambers;

(i) an interlock valve disposed between said first and third chambers to selectively block gaseous flow therebetween, said interlock valve being responsive to movement of said spout into the fill pipe after said seal establishing means

establishes a seal between the fill tank opening and the vapor return passage; and

(j) an excess pressure valve disposed between said second and third chambers to selectively block gaseous flow between said second and third chambers, said excess pressure valve being closable in response to a predetermined gaseous pressure in the fill tank.

4,418,731

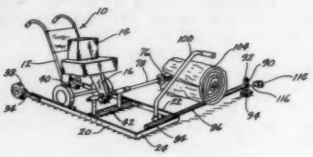
ADAPTER FRAME FOR ROTO-TILLERS

Roger M. Smith, 205 Prospect St., and Steven J. Smith, R.R. 1, both of Shell Rock, Iowa 50670

Filed Jan. 29, 1979, Ser. No. 6,996

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—194 **10 Claims**



1. A log splitter attachment for use with garden tillers having a tiller frame, a tiller power drive means and a tiller drive shaft, said splitter attachment comprising:

a ground supported frame portion,

attachment means, mounted on said frame portion, for rotatably receiving said tiller drive shaft, thereby operatively connecting said garden tiller to said log splitter attachment,

said attachment means being vertically adjustable to vary the operative height of said tiller drive shaft relative to the ground,

a log splitting screw having means attached thereto for releasable attachment to said tiller drive shaft to allow for rotational movement of said splitting screw in unison with said tiller drive shaft and in generally axial alignment therewith, and

a log support bar attached to said frame portion and extending outwardly therefrom for ground engaging support, to provide support for logs during use and to stabilize said frame portion and said tiller

said attachment means being laterally adjustably mounted on said frame portion relative to the axes of said tiller drive shaft and log splitting screw whereby the distance between said log splitting screw and log support bar may be varied to accommodate logs of various lengths.

4,418,732

HAND TOOL AND A CORE REINFORCED MOLDED SYNTHETIC MATERIAL HANDLE THEREFOR

Robert A. Kolonia, R.D. #3, Agnes Rd., Box 318, Milford, N.J. 08848

Filed Sep. 24, 1980, Ser. No. 190,539

Int. Cl.³ B26B *23/00*

U.S. Cl. 145—2 R **17 Claims**

1. A molded synthetic tool handle comprising:

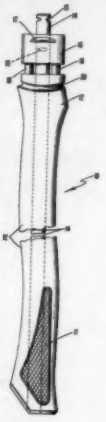
(a) a synthetic material molded around an elongated reinforcing core which has a free end,

(b) said synthetic material having an outer shape conforming to a handle designed for the specific tool for which it is to be used,

(c) said molded synthetic material forming a tool carrying section at one end of the handle and a hand holding section extending from the tool carrying section,

(d) said tool carrying section including a separator portion having a shaped outer surface and being longitudinally spaced along the reinforcing core at a location between the end of the hand holding section and the free end of the core to form laterally spaced bonding material fill areas located on opposed sides of the separator portion,

(e) said tool carrying section including means to mechanically interlock the molded synthetic material of the separator portion with the rigid, reinforcing core,



(f) said hand holding section being free of any additional mechanical interlock relative to the core adjacent the separator portion thereby having freedom for expansion and contraction along the core and thereby being movable with respect to the separator portion.

4,418,733

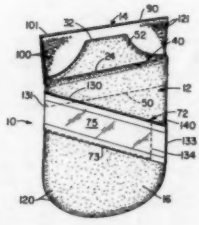
HOLDING DEVICE

Robert A. Kallman, 2030 Haring St., Brooklyn, N.Y. 11229

Filed Dec. 7, 1981, Ser. No. 328,370

Int. Cl.³ B65D *30/10*

U.S. Cl. 383—11 **9 Claims**



1. A device for holding objects, said device being substantially flat when empty of said objects, comprising:

a receptacle having flexible front and rear panels, said front and rear panels being secured to each other along the respective sides and bottoms to form a first compartment;

said rear panel having an extension piece extending above said first compartment;

a fastener having first means on one side thereof for attachment to a base object and second means on a second side thereof for securing said receptacle to said fastener, said extension piece and said second means of said fastener being comprised of complementary materials which are secured together when pressed; and

wherein said receptacle's front and rear panel bottoms are rounded for encasing a cylindrical object, whereby said

compartment substantially conforms to a cylindrical object inserted therein.

4,418,734

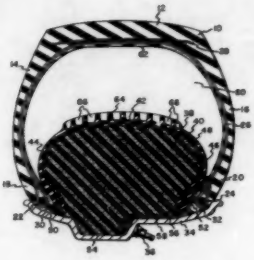
SAFETY SUPPORT SYSTEM

Robert L. Dobson, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 19, 1982, Ser. No. 359,772

Int. Cl.³ B60C *17/00*

U.S. Cl. 152—158 **9 Claims**



1. A safety support system for a tire and rim assembly in which the tire is a tubeless tire having a tread, sidewalls and bead portions mounted on bead seats of a rim comprising a safety support with a toroidal safety support body of resilient foam material for positioning within said tire, said safety support having a predetermined radially outer diameter less than the radially inner diameter of said tire, a pair of reinforcing bead rings positioned at the surface and at each side of said body, at least one ply of reinforcing fabric wrapped around a radially outer wall of said safety support and extending between said bead rings for reinforcing said sidewalls and said outer wall to control expansion of said safety support beyond said outer diameter, said safety support body having a radially inner diameter substantially the same as the diameter of said rim, said resilient foam material of said safety support body containing cells of gas under pressure for expanding said body in an axial direction and exerting an axial force against said bead portions of said tire seated in said bead seats of said rim to provide cushioning and support of said tire and resist circumferential movement of said bead portions of said tire relative to said rim upon deflation of said tire.

4,418,735

TIRE, PARTICULARLY FOR AIRPLANES, HAVING A CROWN REINFORCEMENT WITH EXTENSIBLE EDGES AND METHOD OF MANUFACTURING SAME

Jacques Musy, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

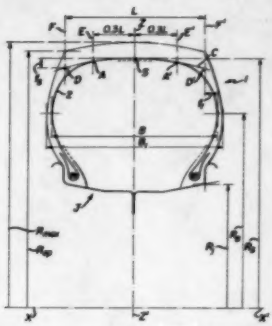
Filed Feb. 5, 1982, Ser. No. 346,128

Claims priority, application France, Feb. 12, 1981, 81 02788; Dec. 23, 1981, 81 24263

Int. Cl.³ B60C *9/00*

U.S. Cl. 152—200 **18 Claims**

1. A tire for airplanes having a carcass reinforcement formed of at least one ply of radial cables which is anchored to at least one bead ring in each bead and a tripartite crown reinforcement composed of a median portion and two lateral portions, each of the edges of the median portion being in contact with a lateral portion, each of these three portions being formed of at least one ply of textile cables forming an angle of between 0° and 30° with the circumferential direction of the tire, the relative camber of convexity of the carcass reinforcement in the crown being at most 0.12, preferably between 0.04 and 0.10, and the relative camber of convexity of the carcass reinforcement in the sidewalls being at most 0.14 when the tire is mounted on its service rim and inflated to its service pressure but not under load, the tire thus having a quasi-rectangular meridian profile, this tire being characterized by the fact that when it is mounted on its service rim but not inflated, its carcass reinforcement has a relative camber of convexity in the crown of at most 0.20, preferably between 0.08 and 0.15, and a relative camber of convexity in the sidewalls of at most 0.25



and a length such that after inflation of the tire to its service pressure its equilibrium curve at the level of the shoulders is located radially outwards of its curve in the uninflated tire, and by the fact that the median portion of the crown reinforcement is formed of cables whose extensibility is low, preferably close to zero, while the lateral portions of the crown reinforcement are formed of cables of very great extensibility.

4,418,736

VEHICLE TIRE

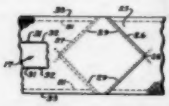
Garret K. Vandenburgh, 1008 Grove St., Winnetka, Ill. 60093

Division of Ser. No. 786,068, Apr. 11, 1977, Pat. No. 4,341,577.

This application Jan. 18, 1982, Ser. No. 339,905

Int. Cl.³ B60C *9/02*

U.S. Cl. 152—354 R **6 Claims**

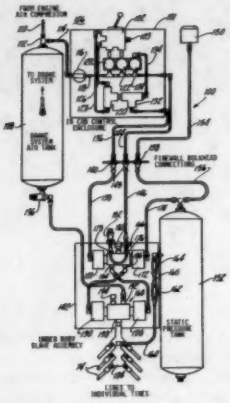


1. In a high performance tire for mounting on a rim and comprising a casing in the form of a toroid which encompasses an inner tube inflated to a pressure of at least seventy-five pounds per square inch and wherein the casing is formed of a fabric which is continuous in a direction circumferentially of the outside of said toroid, the improvement wherein said casing consists essentially of a woven fabric, said fabric having woof and warp threads and being substantially free of binder therein, said woof and warp threads being positioned in a bias alignment with respect to said circumferential direction.

4,418,737
AUTOMATIC TIRE INFLATION SYSTEM

Fred L. Goodell, Grosse Ilse, and Michael J. Ellison, Canton, both of Mich., assignors to AM General Corporation, Detroit, Mich.

Filed Jul. 31, 1981, Ser. No. 288,834
Int. Cl.³ B60C *29/00*
U.S. Cl. 152—416 **14 Claims**



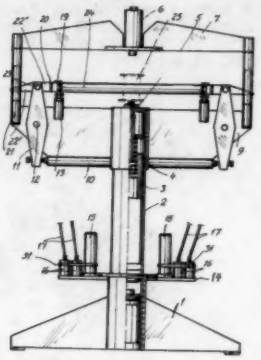
1. In an automatic tire inflation system for a vehicle, the improvement comprising:
- first means coupled to the tires for providing an output associated with the actual tire pressure;
- manually actuable selector means in the vehicle cabin for generating an output associated with one of a plurality of tire pressures that may be desired for the vehicle under various operating conditions;
- control means adapted to receive the outputs from the first means and selector means, operative to automatically adjust and constantly maintain the pressure in the tires at the desired pressure without further manual intervention as a function of the differential between said outputs associated with the actual and desired pressures.

4,418,738
DEVICE FOR AUTOMATICALLY TIGHTENING SPOKES IN SPOKE WHEELS

Roland Kaufeldt, Bovägen 6, Tyresö, Sweden

Filed Apr. 13, 1981, Ser. No. 253,219
Claims priority, application Sweden, Oct. 17, 1979, 7908635
Int. Cl.³ B60B *1/04*
U.S. Cl. 157—1.55 **7 Claims**

1. A device for automatically tightening spokes in spoke wheels consisting of a hub, a plurality of spokes, and a wheel rim, said spokes being passed through apertures in said hub and wheel rim, respectively, and being provided with loosely threaded spoke nipples outside the periphery of the wheel rim, said device comprising
- clamping means,
- wheel hub support means,
- said clamping means being disposed to clamp the hub of a wheel to said wheel hub support means,
- wheel rim support means,
- said wheel rim support means being disposed to support the rim of the wheel,
- wheel rim engagement means comprising a plurality of segment blocks disposed along the periphery of the wheel rim, each of said segment blocks being actuable by a respective rocker arm,
- said wheel rim engagement means being further disposed to engage substantially the entire periphery of the wheel rim radially from the outside for causing said periphery to become accurately round and for urging the wheel rim toward the wheel hub,
- wheel rim urging means,
- said wheel rim urging means being disposed to urge the wheel rim toward said wheel rim support means, and

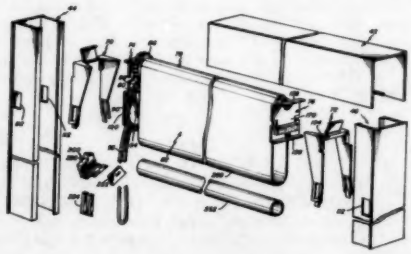


- automatic spoke nipple tightening means,
- said spoke nipple tightening means being disposed to tighten all of the spoke nipples of the wheel automatically and simultaneously, each with an individual predetermined torque.

4,418,739
INSULATING WINDOW COVERING

James Woolnough, Brattleboro; Bruce Gardner, Guilford, both of Vt., and David A. May, Brookline, Mass., assignors to Appropriate Technology Corporation, Brattleboro, Vt.

Filed Jan. 15, 1982, Ser. No. 339,334
Int. Cl.³ A47H *11/06*; E06B *9/171*
U.S. Cl. 160—120 **13 Claims**



10. An insulating window shade assembly comprising:
- a top channel and a pair of opposed, inwardly open U-shaped side channels intended to be permanently secured on the inside of a window about the window opening,
- a sub-assembly including
  - a pair of parallel rollers each carrying a shade panel of flexible material wound in opposite directions on the rollers,
  - spur gears mounted on the rollers and engaging each other causing the rollers to rotate simultaneously and in opposite directions when one is rotated, bearing plates supporting the ends of the rollers,
  - a cord and pulley supported by one of the bearing plates and having a gear registering with one of the gears on the rollers to impart rotation to the rollers,
  - and a pair of mounting brackets each supporting one of the bearing plates,

and means provided in the side channels and the brackets enabling the subassembly to be snapped as a unit in place within the channels.

4,418,740

CENTRIFUGAL CASTER

Ronald Friedrich, Kamp-Lintfort, Fed. Rep. of Germany, and Werner Hammecke, deceased, late of Bohmte, Fed. Rep. of Germany (by Marie Elise Gisela Hammecke, heiress), assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

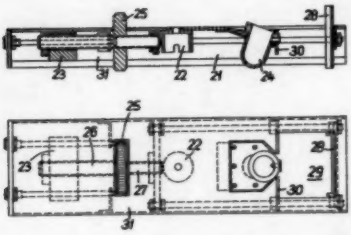
PCT No. PCT/DE80/00114, § 371 Date Mar. 26, 1981, § 102(e) Date Mar. 26, 1981, PCT Pub. No. WO81/00366, PCT Pub. Date Feb. 19, 1981

PCT Filed Aug. 2, 1980, Ser. No. 247,292

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1979. 2932681

Int. Cl.³ B22D *13/00*

U.S. Cl. 164—287 **1 Claim**



1. A centrifugal caster comprising: a motor driven centrifuge arm; a weight arm connected to said centrifuge arm, both said arms being rotatable about a vertical axis; a counterweight mounted to said weight arm for horizontal movement relative to said weight arm; a casting muffle; a casting chamber connected to said centrifuge arm, said casting chamber being provided with a region for mounting said casting muffle; a melting crucible disposed in said casting chamber; a guide carriage accomodating said casting muffle for horizontal movement relative to said centrifuge arm; first and second spindles having different, oppositely oriented threads; and a hand wheel coupled with said carriage and said counterweight via a respective one of said first and second spindles for horizontally displacing said casting muffle and said counterweight with respect to said centrifuge arm and said weight arm, respectively.

4,418,741

METHOD OF CONTROLLING RELATIVE MOVEMENT BETWEEN AN INGOT AND A MOLD

Oleg P. Bondarenko, ulitsa Kreschatik, 15, kv. 36; Igor A. Genis, ulitsa Nischinskogo, 5, kv. 39; Vitaly M. Baglai, bulvar Lesi Ukrainki, 2, kv. 51; Boris B. Fedorovsky, ulitsa Mechnikova, 7a, kv. 26; Boris I. Medovar, ulitsa Anri Barbjusa, 22/26, kv. 109; Grigory A. Timashov, bulvar Davydova, 7, kv. 143; Vasily I. Us, ulitsa Saxaganskogo, 58, kv. 12; Georgy S. Pavlichenko, ulitsa B. Kitaevskaya, 61a, kv. 18, and Igor G. Sidorenko, ulitsa Bereznyakovskaya, 24, kv. 104, all of Kiev, U.S.S.R.

Filed Nov. 26, 1979, Ser. No. 97,216

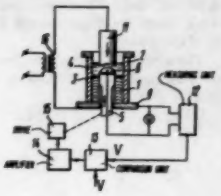
Int. Cl.³ B22D *11/16, 27/02*

U.S. Cl. 164—454 **9 Claims**

1. A method of controlling the relative movement between an ingot and a mold, comprising the steps of:

preparing a molten metal pool covered with a bath of molten slag in a melting space, defined by a base plate and said mold, by melting a consumable electrode;

monitoring the level of said molten metal pool in said mold by measuring the voltage between said ingot and an insulated section of said mold, said insulated section of said mold being disposed above said metal pool and in contact with said bath of molten slag and being electrically insulated from said ingot and an ingot-forming section of said mold;



comparing an instantaneous value of said voltage with a predetermined value of said voltage; and

varying the relative speed of the ingot and the mold depending on a signal proportional to the difference between said instantaneous and said predetermined values of said voltage, to restore a predetermined level of said metal pool.

4,418,742

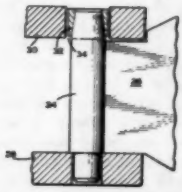
ROTOR CONSTRUCTION FOR ROTARY REGENERATIVE AIR HEATER

James C. Conde, North Royalton, and Paul S. Larsen, Canal Fulton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 7, 1982, Ser. No. 386,169

Int. Cl.³ F28D *19/04*

U.S. Cl. 165—8 **3 Claims**



1. A rotary regenerative heat exchanger comprising:

(a) a plurality of radial plates connected to a plurality of radial plate pins which engage an upper and lower core plate, each core plate concentrically surrounding and attached to a rotor shaft;

(b) a plurality of bushings inserted into apertures in the upper core plate, each bushing engaging the upper terminus of a corresponding radial plate pin, the lower core plate having apertures which engage the lower terminus of a corresponding radial plate pin;

(c) a plurality of full-sector baskets stacked vertically and retained within compartments formed by adjacent pairs of the radial plates, the baskets containing heat-absorbent material;

(d) means for passing heating and cooling fluids through the rotor; and

(e) means for rotating the rotor about its axis.

4,418,743
ELECTRONIC CIRCUIT FOR CONTROLLING A HEATING OR AIR-CONDITIONING APPARATUS IN A MOTOR VEHICLE

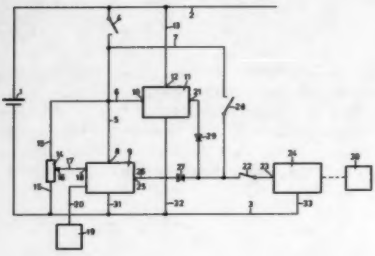
Kurt Dietzsch, Leonberg-Eltingen, and Rainer Knoblauch, Stuttgart, both of Fed. Rep. of Germany, assignors to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co. K.G., Stuttgart, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,261

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3015921

Int. Cl.³ F28D *21/00*; F28F *27/00*

U.S. Cl. 165—12 **5 Claims**



1. In an electronic circuit for controlling the heating or air conditioning apparatus in a motor vehicle having its own power system, an ignition switch, an electronic thermostat, a manually adjustable temperature setting means, a valve activating device and valve means for controlling the flow of conditioning medium within the heating or air conditioning apparatus, said arrangement comprising said ignition switch, said thermostat and said valve activating device being connected in series with the vehicle's power system in a first circuit, said thermostat being controlled by said manually adjustable temperature setting means, and said valve means being controlled by said valve activating device, whereby current to said thermostat and said valve activating device is interrupted when said ignition switch is open,

the improvement wherein said motor vehicle further includes a timing element means for switching on to allow flow of current therethrough for a predetermined time after said ignition switch has been opened, and two limit switch means for permitting said valve activating device to be actuated or deactuated, respectively, independently of said ignition switch and said timing element means, and wherein said arrangement further comprises said valve activating device being simultaneously connected into a second circuit connected to the vehicle's power system in parallel with said ignition switch, said second circuit including said timing element means, such that flow of current to said valve activating device is permitted through said timing element means for a predetermined time after said ignition switch has been opened, and has turned off said first circuit, and wherein said two limit switch means are controllable by means of said temperature setting means.

4,418,744
AIR CONDITIONING CONTROL SYSTEM WITH USER POWER UP MODE SELECTION

Donald L. Sidebottom, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 5, 1982, Ser. No. 365,766

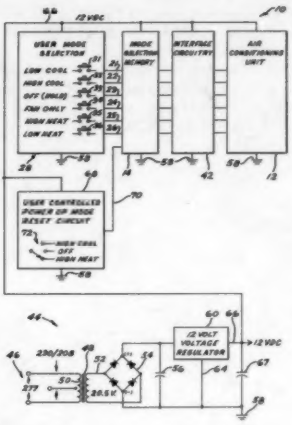
Int. Cl.³ F25B *29/00*; H03K *17/00*

U.S. Cl. 165—25 **5 Claims**

1. An electronic control system for an air conditioning unit having a plurality of operational modes, said control system adapted for operation from a power source subject to interruption, and comprising:

a volatile mode selection memory capable of storing representations corresponding to each of the operational modes, said memory having mode selection inputs responsive to momentary actuations;

an operative connection between said memory and the air conditioning unit to effect operation of the air conditioning unit in the mode corresponding to any particular stored representation; and



a power on reset circuit connected to said mode selection memory and arranged to cause the air conditioning unit to resume operation in a particular selected mode upon restoration of power following a power interruption; said power on reset circuit including a user operable power up mode selection switch for allowing user selection of the particular mode in which operation resumes, the user power up mode selections including at least a plurality of the operational modes.

4,418,745
APPARATUS FOR HEATING PERSONS TRAVELLING IN OR ON OPEN VEHICLES HAVING INTERNAL COMBUSTION ENGINES

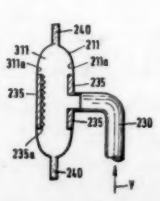
Oskar W. K. Roehr, Windmühlenstieg 15, 2000 Hamburg 52, Fed. Rep. of Germany

Filed Apr. 8, 1981, Ser. No. 252,068

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 8027178; Oct. 15, 1980, 8027524; Oct. 7, 1980, 8029729; Nov. 25, 1980, 8031329

Int. Cl.³ B60H *1/18*

U.S. Cl. 165—46 **22 Claims**



1. An apparatus for heating persons, comprising a hot air generator arranged to be supplied with heat from an internal combustion engine, an article of clothing including an air

carrying system with hot air outlet openings in said article of clothing facing the body of the person to be heated, said air carrying system is connected to said hot air generator, said article of clothing is made of an air-impermeable material and comprises at least two layers including an inner layer closer to the body of the person to be heated and an outer layer, said inner layer and outer layer each having an inner surface facing the inner surface of the other, said inner and outer layers are connected together at spaced locations and between the spaced locations form air ducts forming said air carrying system, wherein the improvement comprises that said inner and outer layers of said article of clothing are welded together at the spaced locations, said air outlet openings facing the body of the person to be heated are located in said inner layer adjacent to the location where said inner and outer layers are welded together, a hot air inlet nozzle opens into said air carrying system into the space between said inner and outer layers with said nozzle extending through one of said inner and outer layers, an insulating layer extending around the air inlet nozzle on the inside surface of the one of the inner and outer layers through which said air inlet nozzle extends into the space between said layers, and an insulating layer on the inside surface of the other one of said inner and outer layers located opposite the opening from said air inlet nozzle.

4,418,746

PLATE-TYPE HEAT-EXCHANGER AND MANIFOLD ASSEMBLY

Günter Langenhorst, and Christoph Langenhorst, both of Bad Sassendorf, Fed. Rep. of Germany, assignors to Top-Element Bauelemente für Innenausbau and Raumgestaltung GmbH & Co. KG, Hamm, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,264

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133790

Int. Cl.³ F28F *9/04, 9/14*

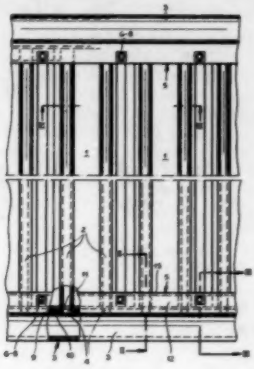
U.S. Cl. 165—76 **10 Claims**

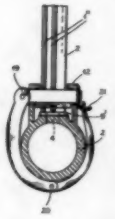
1. A heat exchanger comprising:

a heat-exchange plate having an edge and formed with a plurality of parallel spaced-apart longitudinal passages opening at said edge and with a plurality of transversely throughgoing plate holes at said edge between said passages;

a manifold pipe formed with a row of manifold holes all opening in the same direction and spaced apart the same as said passages at said edge, whereby said edge can be fitted over said row of manifold holes with each of said passages aligned longitudinally with a respective one of said manifold holes; a pair of L-section guides fixed on said pipe flanking said row of manifold holes and defining a gap corresponding to the shape of said plate at said edge, said guides being formed between said manifold holes with laterally throughgoing guide holes transversely alignable with said plate holes when said edge is fitted over said row of manifold holes; and

means including a plurality of holders engageable transversely through the aligned guide and plate holes for





securing said plate to said manifold pipe for fluid flow between said passages and the interior of said pipe.

4,418,747

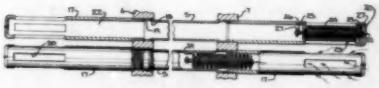
SHUTTLE CLEANING OF HEAT EXCHANGER TUBES

Walter J. Baron, and Laird C. Cleaver, both of Milwaukee, Wis., assignors to Water Services of America, Inc., Milwaukee, Wis.

Filed Feb. 16, 1982, Ser. No. 348,742

Int. Cl.³ F28F *5/00*

U.S. Cl. 165—95 **9 Claims**



1. For use in cleaning a heat exchanger tube adapted to have a fluid reversably flowable therethrough and having capturing devices disposed at each end, and with said capturing devices having abutments thereon, a shuttle assembly for making back-and-forth passes through said tube between said capturing devices in response to fluid flow, said shuttle assembly comprising:

(a) a spring tube cleaning element,

(b) a pair of rigid longitudinally spaced mounting members secured to said spring,

(c) a rod disposed coaxially with and longer than said spring and with said rod having said mounting members and said spring freely shiftable thereon,

(d) and stop members disposed at each end of said rod,

(e) the ends of said rod being adapted to engage the abutments of said capturing devices when said shuttle assem-

bly reaches the ends of said tubes so that said spring and mounting members freely shift on said rod until one of said mounting members engages one of said stop members.

4,418,748

HEAT EXCHANGER WHOSE HOT END HAS A DEVICE FOR PROTECTING THE TUBE PLATE

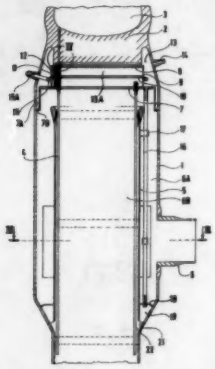
Pierre Pouderoux, Meudon la Foret; Guy Salon, Parly II, and Thong Nguyen-Thanh, Cernay-la-Ville, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Stein Industri, Velizy Villacoublay, both of, France

Filed Jan. 27, 1982, Ser. No. 343,246

Claims priority, application France, Feb. 2, 1981, 81 01954

Int. Cl.³ F28D *7/00;* **F28F** *9/22, 13/06;* **F22B** *1/06*

U.S. Cl. 165—134 R **5 Claims**



1. A heat exchanger comprising an outer casing closed at its hot and cool ends by two tube plates, a cluster of tubes which is connected to the tube plates to discharge into inlet and outlet collectors of a fluid flowing inside the tubes, and inlet and outlet tubings of a liquid flowing in the casing and around the tubes, wherein the exchanger comprises at its hot end a device for protecting the tube plate, such device comprising two plates united by a casing to define a first zone filled with such liquid in the static state forming a thermal screen, such plates being substantially parallel with the tube plate and a first one of such plates being disposed adjacent the tube plate, the protective device also comprising passages extending through such zone from one plate to another, and means for setting up a negative pressure between such first plate and the tube plates, to ensure that such liquid flows towards the tube plate inside such passages.

4,418,749

HEAT EXCHANGER

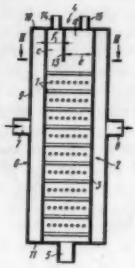
Boris P. Vasiliev; Nikolai L. Borisov; Mikhail K. Semenov; Ivan K. Ponomarev; Galina B. Tyryshkina, and Igor V. Gorbatenko, all of Belgorod, U.S.S.R., assignors to Belgorodsky Zavod Energeticheskogo Mashinostroenia, U.S.S.R.

Filed Oct. 30, 1981, Ser. No. 316,877

Int. Cl.³ F28F *7/00*

U.S. Cl. 165—139 **1 Claim**

1. In a heat exchanger for the recovery of heat from shale ashes in a process for the continuous retorting of oil shale, the ashes incoming as at least two flows under different pressures, having a plurality of tubes arranged in at least two horizontal side-by-side planes and serving to conduct a fluid for heat exchange, the tubes in one plane being transverse to those of the other plane, said tubes being held at their ends in the side walls of a frame open at two sides transverse to the side walls to form an inlet and outlet for hot shale ashes, and a housing surrounding said frame and having an inlet and outlet, said housing engaging the frame to form with the housing inlet and outlet a flow path for said fluid through the plurality of tubes in said side-by-side planes the improvement which comprises the side walls of said frame, having portions extending above the tubes in the upper one of said at least two horizontal side-by-side planes and up to the upper portion of said housing, which upper portion having at least two inlets for hot shale



ashes, and defining an inlet space, at least one partition plate attached to the upper portion of said housing between said inlets for hot shale ashes and extending downwardly, thereby providing at least two compartments each having a cross-sectional area in proportion to the amount of shale ashes incoming through said inlets, said partition plae extending downwardly for an amount sufficient to equalize pressure in the adjacent compartments.

4,418,750

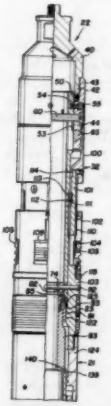
WELL TOOL

James H. Paschal, Jr., Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 13, 1981, Ser. No. 310,823

Int. Cl.³ E21B *23/00, 34/14*

U.S. Cl. 166—214 **12 Claims**



1. A running tool for installing a spring operated safety valve in a landing nipple of a well tubing string comprising: a body having means for connection with a handling tool string and means for connection with a lock mandrel connected with said safety valve; a core connected with said body and connectible with said lock mandrel for applying forces to drive said lock mandrel and safety valve into said landing nipple; and a spring isolator tube assembly connected with said core and engageable with a spring operator tube of said safety valve to com-

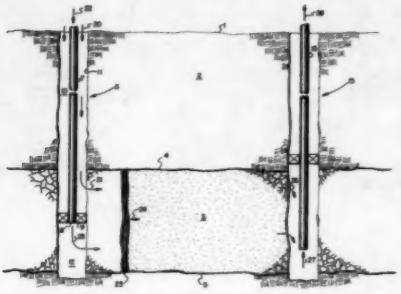
press the spring of said valve and isolate said tube from said forces directed toward said mandrel and safety valve.

4,418,751

IN-SITU COMBUSTION PROCESS

Leonard W. Emery, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 31, 1982, Ser. No. 364,116
Int. Cl.³ E21B *43/243*
U.S. Cl. 166—261 **6 Claims**



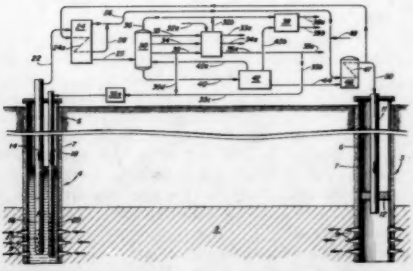
1. A method for conducting an in situ combustion process in a hydrocarbon-bearing subsurface geologic formation comprising providing at least one wellbore having a tubing string in the interior thereof extending for a portion of the length thereof to the vicinity of said formation and an annulus between the exterior of said tubing and interior of said wellbore, the portion of said wellbore below the end of said tubing being physically separated from said annulus, injecting water into said annulus and from there into an upper portion of said formation, at essentially the same time as said water injection injecting essentially pure oxygen into said tubing and from there into a lower portion of the same said formation for in situ combustion of said oxygen and part of the hydrocarbon already present in said formation, whereby said water and oxygen are separately injected into said formation without prior mixing of same in said wellbore.

4,418,752

THERMAL OIL RECOVERY WITH SOLVENT RECIRCULATION

Lyndon D. Boyer; Ardis L. Anderson, both of Ponca City, Okla., and Michael W. Britton, Corpus Christi, Tex., assignors to Conoco Inc., Ponca City, Okla.

Filed Jan. 7, 1982, Ser. No. 337,799
Int. Cl.³ E21B *43/24, 43/40*
U.S. Cl. 166—267 **10 Claims**



1. In a method for the recovery of oil from a subterranean reservoir containing oil therein having a density greater than the density of water and penetrated by a production well, wherein a hot aqueous fluid is injected into said reservoir to reduce the viscosity of oil within said reservoir to facilitate the flow of oil into said well and a diluent solvent is circulated down said well to produce a solvent-oil blend of decreased viscosity which is produced from said well in admixture with water, the improvement comprising:

(a) employing a diluent having a density such that the density of the resulting oil-solvent blend is greater than the density of the water produced from said well along with said blend,

(b) separating said water from said oil-solvent blend,

(c) fractionating the oil-solvent blend to recover a solvent fraction having a density as set forth in step (a), and

(d) circulating said solvent fraction down said production well in accordance with step (a).

4,418,753

METHOD OF ENHANCED OIL RECOVERY EMPLOYING NITROGEN INJECTION

Thomas J. Morel, and Stewart Haynes, Jr., both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,804
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—273 **24 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems, the steps comprising:

(a) injecting into said reservoir via said injection system a light hydrocarbon slug at a rate sufficient to cause fingering of said light hydrocarbon through the oil in said reservoir to formulate a mixture of said light hydrocarbon and said reservoir oil adjacent said injection system,

(b) thereafter, injecting into said reservoir via said injection system a predominantly nitrogen-containing gas at a rate to produce a flow velocity which is less than the flow velocity of said light hydrocarbon slug and in an amount sufficient to strip previously-injected light hydrocarbon from said reservoir oil to form a transition zone of conditional miscibility;

(c) injecting a driving fluid into said reservoir via said injection system to drive said transition zone through said reservoir and displace oil to said production system; and

(d) recovering oil from said production system.

4,418,754

METHOD AND APPARATUS FOR GRAVEL PACKING A ZONE IN A WELL

Lee W. Stepp, Comanche, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 2, 1981, Ser. No. 326,681
Int. Cl.³ E21B *43/04*
U.S. Cl. 166—278 **16 Claims**

7. Apparatus adapted to be lowered on tubing into a well bore for setting a gravel pack at the bottom of the well, said apparatus comprising,

a screen having an open top and perforated side,

screen support means for supporting said screen, said screen support means including screen releasing means for disconnecting said screen from said screen support means;

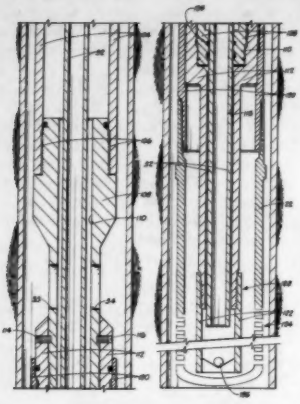
a gravel packing port in said screen support means;

conduit means for providing a gravel slurry flow path from the tubing to said gravel packing port, through the outside of said screen to the inside, and from thence to the bore annulus;

packer means mounted around said conduit means between said gravel port and said tubing, said packer means adapted to be set into sealing engagement with the well bore responsive to longitudinal and rotational movement of said tubing; and

clutch means operatively connecting said screen support

means to said conduit means, said clutch means, when in an engaged condition, transmitting longitudinal and rotational tubing movement to said screen support means and,



when in a disengaged condition, permitting such tubing movement without movement of said screen support means.

4,418,755

METHODS OF INHIBITING THE FLOW OF WATER IN SUBTERRANEAN FORMATIONS

Thomas R. Sifferman, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 121,551, Feb. 14, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,746

Int. Cl.³ E21B *33/138*

U.S. Cl. 166—281 **16 Claims**

1. A method of inhibiting the flow of water in a subterranean formation comprising introducing a gelling agent into said formation having the property of forming a highly viscous gel in the presence of water, wherein said gelling agent is a surface active agent selected from the group consisting of ethoxylated alcohols, ethoxylated aliphatics, amido betaines, polyoxyethylene oleyl ether, polyoxyethylene 20 sorbitan mono-oleate, and polyoxyethylene fatty glyceride and mixtures of such agents.

4,418,756

METHOD AND APPARATUS FOR PERFORMING OPERATIONS IN WELL TUBING

John H. Yonker, Carrollton, and Henry P. Arendt, Dallas, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Sep. 8, 1981, Ser. No. 299,931

Int. Cl.³ E21B *23/08*

U.S. Cl. 166—383 **13 Claims**

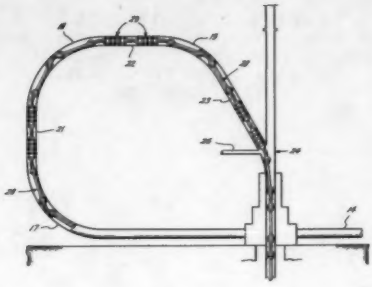
1. The method of performing operations in a well having an entry loop of pipe at the wellhead comprising;

establishing reverse fluid communication with the loop on the wellhead side of the loop;

making up a TFL train with a tool, spacer bars and pistons with said spacer bars having a length between the pistons and tool which will position pistons in the loop and on the loop side of the point of reversing fluid communication with the tool positioned to do work in the well;

running said TFL train into the loop and well;

loading all of said pistons with pressure fluid so that all pistons will exert a force on the TFL train; and



performing the desired operation while said pistons are in said loop.

4,418,757

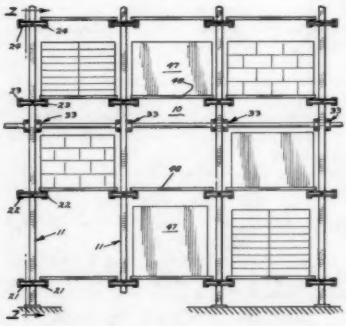
STORAGE RACK STRUCTURAL SPRINKLER SYSTEM

Jerome P. Merkel, Plymouth, Minn., assignor to United Sprinkler, Inc., Hamel, Minn.

Filed Dec. 8, 1980, Ser. No. 213,855

Int. Cl.³ A62C *37/00*

U.S. Cl. 169—54 **9 Claims**



1. A fire protection and structural storage rack system which supports vertically spaced apart load support means, comprising in combination;

a plurality of like, horizontally spaced apart vertical side frame members;

a plurality of open ended sprinkler conduits disposed in horizontal axial alignment intermediate adjacent vertical side frame members, each of said plurality of sprinkler conduits having ends which are rigidly and structurally connected to and at said vertical side frame members in cooperable supporting relationship with said vertical side frame members to form said storage rack system for supporting the vertically spaced apart load support means while said ends of adjacent sprinkler conduits are in axially spaced apart relationship at said vertical side frame members; and

fluid coupling means joining each said axially spaced apart ends of said conduits independently of said vertical side frame members.

4,418,758

TRACTIVE FORCE SENSING SYSTEM FOR TRACTOR

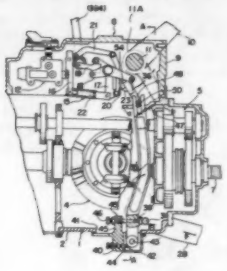
Tsutomu Fujimoto, Fujiidera, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Mar. 16, 1981, Ser. No. 244,120

Claims priority, application Japan, Jul. 16, 1980, 55-101089[U]

Int. Cl.³ A01B *63/112*; B60D *1/00*

U.S. Cl. 172—7 **2 Claims**



1. A tractive force sensing system for a tractor provided with a hydraulic device (8) having a draft control function to actuate an oil pressure control valve (12) through a draft cam (23) by tractive force (F) from a pair of lower links (28), said system comprising:

a lower link support (31) passing transversely through the inside of a lower portion of a transmission case of a vehicle body (1), and adapted to be resiliently bent and deformed by said tractive load (F),

a first feedback link (35') having a cam follower (39') in contact with an axially central region of said lower link support (31) and a bifurcated upper end defining an engagement groove, and

a second feedback link (36') having an engagement member (50) engaging said groove, and operatively and directly connected to said draft cam (23),

said transmission case (2) including an opening (41) in a bottom wall thereof, a box (40) being removably attached to said bottom wall across said opening such that said box (40) projects downwardly from said bottom wall,

said first feedback link (35') having a lower end pivotally connected to said box (40) at a position below said lower link support (31), said box (40) including at least one stopper means (46) for restricting swinging movement of said first feedback link (35') in a predetermined range.

4,418,759

SOIL LEVELING APPARATUS

Orlan H. Mork, 6029 225th St. West, Farmington, Minn. 55024

Continuation-in-part of Ser. No. 224,458, Jan. 12, 1981. This application Aug. 28, 1981, Ser. No. 297,133

Int. Cl.³ E02F *3/64*

U.S. Cl. 172—197 **20 Claims**

1. An apparatus for leveling soil and the like, comprising:

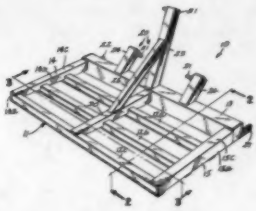
a generally rectangular frame including a leading transverse, elongate scraper member and a plurality of trailing transverse elongate ground-engaging members fixedly secured in mutually spaced-apart relationship between a pair of longitudinal side members and at least one longitudinal intermediate member;

the scraper member including a lower edge and each ground-engaging member including a lower surface, with the lower edge of the scraper member and the lower surfaces of the ground-engaging members of said frame being substantially co-planar;

means mounted on said frame for releasably connecting the apparatus to a draft means;

a plurality of scarifiers depending in mutually spaced apart relationship adjacent to the scraper member of said frame;

means for supporting said scarifiers on said frame for pivotal movement between forward and rearward positions, the scraper member and adjacent ground-engaging member of said frame being spaced apart sufficiently to permit forward pivoting of said scarifiers out of ground engagement upon reversal of the apparatus;



means for supporting said scarifiers for vertical movement between raised and lowered positions;

means associated with said scarifiers for controlling pivotal orientation of said scarifiers in the rearward positions during vertical positioning thereof; and

means connected to said support means for selectively adjusting vertical positioning and thus penetration depth of said scarifiers relative to the soil between the raised and lowered positions.

4,418,760

SUBSOIL PLANAR TOOL AND SHEAR BOLT THEREFOR

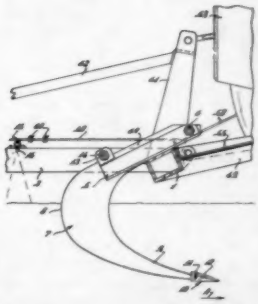
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Aug. 8, 1978, Ser. No. 932,135

Claims priority, application Netherlands, Aug. 15, 1977, 7708954

Int. Cl.³ A01B *61/04*

U.S. Cl. 172—271 **6 Claims**



6. A subsoiler comprising a frame and at least one subsoil planar tool mounted on a support, said support being channel-shaped with upwardly extending limbs and connected to the upper surface of a transverse beam of said frame, said limbs extending a substantial distance in front of and to the rear of said beam, said tool being hook-shaped when viewed from aside and including a forwardly extending upper fastening portion, a curved central portion and a lower soil penetrating portion, said fastening portion having an upper edge and extending for substantially the whole length of said support, a pivot interconnecting the fastening portion to said support

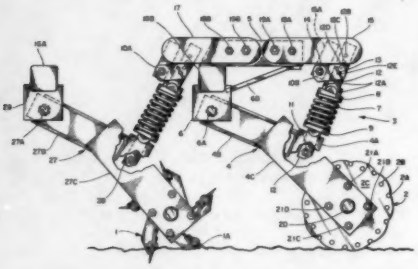
adjacent the forward end thereof and said pivot being located a substantial distance in front of said transverse beam, a shear bolt bridging the limbs adjacent the rear ends thereof and said bolt being located a substantial distance to the rear of said transverse beam and immediately above the upper edge of said fastening portion.

4,418,761

ADJUSTABLE TILLAGE IMPLEMENT POSITIONING APPARATUS

William J. Dietrich, Sr., Congerville, and Cary L. Sizelove, Eureka, both of Ill., assignors to DMI, Inc., Goodfield, Ill.

Filed Sep. 22, 1981, Ser. No. 304,584
Int. Cl.³ A01B *61/04, 29/00, 35/28*
U.S. Cl. 172—271 **13 Claims**



11. An apparatus for mounting and positioning a rotary agricultural implement on a horizontal mounting bar of a tillage machine, said apparatus comprising:

first and second lateral arms rotationally coupled respectively to first and second end portions of said implement and pivotally coupled to said horizontal mounting bar for mounting said implement thereto;

cross member means positioned generally parallel to said mounting bar for rigidly coupling said first and second lateral arms;

support means rigidly coupled to said mounting bar and extending rearward therefrom;

variable length strut means in combination with linearly compressible spring means connected to said cross member means for urging said rotary implement in a downward direction and in contact with the ground being tilled; and

hinged coupling means for pivotally coupling said varible length strut means to said support means for selectively controlling the downward force applied to said implement by said variable length strut means and linearly compressible spring means combination and wherein the upward displacement of said implement is limited by the rotational impact of said hinged coupling means with said support means.

4,418,762

BALANCED IMPLEMENT TRANSPORT VEHICLE

James H. Page, Bottineau, N. Dak., assignor to Western Manufacturing Company, Inc., Bottineau, N. Dak.

Filed Jul. 20, 1981, Ser. No. 285,141
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **8 Claims**

1. An implement drawbar and transport comprising in combination;

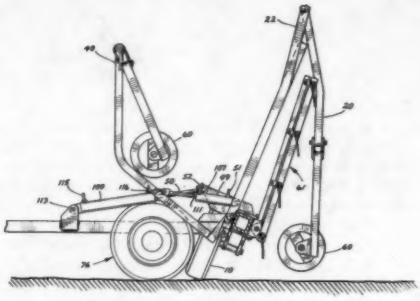
an elongated drawbar means;

dirigible support means adopted for connection to a prime mover and including means for rotatably mounting said drawbar for movement between working and transport positions and in lateral transverse relationship with the line of draft on said support means;

a first plurality of implement draft connection means mounted on said drawbar for rotation therewith for operation between a generally horizontal working position and a generally vertical transport position;

a second plurality of implement draft connection means rotatably mounted on said drawbar means for rotation therewith for operation between a generally horizontal working position, a balanced lifting position and a generally vertical transport position;

first means connected to said second plurality of implement draft means and second means connected to said drawbar means for, said first means independently rotating said second plurality of implement draft means with respect to said drawbar means and said second means rotating said drawbar means and disposing said first plurality of implement draft connection means in a balanced position with respect to said second plurality of draft connection means with said first and second pluralities of draft connection means being on either side of said drawbar as said drawbar is rotated between working and transport positions.



7. The method of lifting and transporting a plurality of earth working implements on a rotatable drawbar which comprises the steps of;

fixedly attaching one half of a plurality of earth working implements to a drawbar rotatable between working and transport positions;

adjustably, rotatively, rigidly attaching the other half of a plurality of earth working implements to said drawbar; positioning said one half and said other half of said plurality of earth working implements on one side of said drawbar in the working position thereof;

rotating said other half of said plurality of earth working implements to a balancing position on the opposide side of said drawbar from said working position;

rotating said drawbar from said working to said transport position; and thereby

rotating said one half of said plurality of earth working implements to a raised transport position on the same side of said drawbar as said working position while maintaining said other half of said plurality of earth working implements on the opposite side of said drawbar.

4,418,763

AGRICULTURAL FOLDING TOOL BAR

Charles Boetto, Naperville, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Oct. 1, 1981, Ser. No. 307,394
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—776 **8 Claims**

1. A folding tool bar adapted to support ground working tools and comprising:

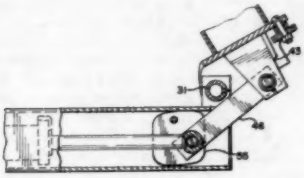
(a) a normally horizontal, hollow central section;

(b) an outer wing section pivotally connected to said central section about an offset axis for movement between a working position in general alignment with said central

section and a folded transport position on said central section, said pivotal connection providing a fulcrum for a portion of said movement;

(c) a hydraulic cylinder mounted in said central section;

(d) a pair of spaced support means substantially spanning the interior of said central section and pivotally connected to the rod end of the cylinder, said connection being sufficiently below the center of said means to effectively increase the lever arm when the wing section is extended; and



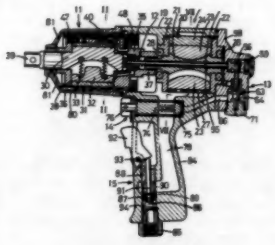
(e) a pair of links pivotally connected to said rod end by slotted openings, said wing having an ear, said ear being pivotally connected to said links, said links upon cylinder actuation, moving said wing upward until said wing passes inwardly over center of said axis and said links contact said fulcrum and pivot thereabout as the wing moves to the transport position, said support means relieving wing fall and said links slotted connection preventing support means binding in said central section in the movement between working and transport and vice versa.

4,418,764

FLUID IMPULSE TORQUE TOOL

Masatoshi Mizobe, Nara, Japan, assignor to Giken Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 14, 1981, Ser. No. 283,152
Int. Cl.³ B23Q *5/06*
U.S. Cl. 173—12 **7 Claims**



1. In a fluid driven torque tool having motor means for generating torque pulses, fluid passageways for conducting a driving fluid to said motor means, moveable pressure relief means coupled with said motor means for maintaining pressure in said motor means below a predetermined amount, an elongated member coupled to, and moveable with, said pressure relief means, for controlling fluid flow through said passageways, and means for automatically blocking flow of said fluid to said motor means when said pressure exceeds said predetermined amount, the improvement comprising:

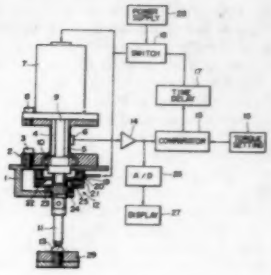
said blocking means comprising a valve having a moveable portion continuously engaging a portion of said elongated member, said elongated member and said valve moveable portion being moveable in directions normal to each other.

4,418,765

POWER-DRIVEN SCREWDRIVER WITH A TORQUE CONTROL

Takashi Mori, Yamatokohriyama; Shuuji Hosokawa, Habikino, and Takao Naito, Katano, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jan. 12, 1982, Ser. No. 338,996
Claims priority, application Japan, Jan. 16, 1981, 56-5279
Int. Cl.³ B25B *21/00*
U.S. Cl. 173—12 **6 Claims**



1. A power-driven screwdriver comprising:

a base;

a motor mounted on said base;

a screwdriver bit mounted on said base and rotatably drivable by said motor to tighten a screw with a tightening torque;

a torque detector mounted on said base for producing a signal representative of said tightening torque;

a torque setting device for generating a signal indicative of a desired tightening torque with which the screw is to be tightened;

a comparator for generating a comparator output signal when said torque representative signal is within a range defined by the signal from said torque setting device;

a switch responsive to said comparator output signal for de-energizing said motor; and

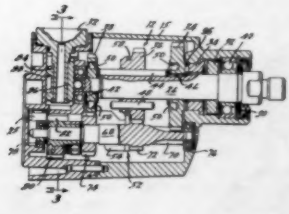
a time-delay circuit interposed between said comparator and said switch for introducing a delay time to said comparator output signal applied to said switch.

4,418,766

COMPACT MULTI-SPEED HAMMER-DRILL

Horst Grossmann, Huenfelden, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Continuation-in-part of Ser. No. 297,015, Aug. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 60,437, Jul. 25, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 312,803
Int. Cl.³ B23B *45/02, 45/16;* B23Q *5/027*
U.S. Cl. 173—13 **7 Claims**



1. In a compact multi-speed hammer-drill having a housing

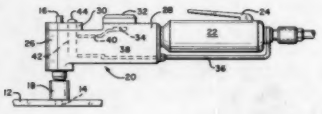
with a motor therein, the hammer-drill having a "drilling" mode of operation and a "hammer drilling" mode, the combination of a rotary-reciprocatory output spindle journaled in the housing and having a limited axial floating movement therein, a fixed hammer member mounted concentrically about the spindle and retained in a forward portion of the housing, a movable hammer member carried on the spindle, concentrically therewith, and cooperating with the fixed hammer member to deliver vibratory impacts to the spindle in the hammer-drilling mode of operation, shiftable means mounted in the housing and engaging an inner portion of the spindle remote from the hammer members for switching from the drilling mode to the hammer-drilling mode, and vice versa, and a three-speed transmission comprising an intermediate shaft journaled in the housing, respective first, second and third idler gears of different sizes on the shaft for conjoint rotation therewith, respective first, second and third output gears of different sizes on the spindle, the first and third output gears being freely rotatably mounted on the spindle, the first output gear being disposed adjacent to the cooperating hammer members and being constantly in mesh with the first idler gear, the third output gear being disposed adjacent to the shiftable means and being constantly in mesh with the third idler gear, the second output gear being in mesh with the second idler gear in one of the three speeds of operation, keying means between the second output gear and the spindle for conjoint rotation therewith in all three speeds of operation, means for moving the second output gear axially in either direction along the spindle in juxtaposition to the first and third output gears, respectively, and means responsive to the juxtaposition of the second output gear to either the first and third output gears, respectively, for coupling either the first or third output gears to the spindle, respectively, thereby providing for two additional speeds of operation.

4,418,767

INTERCHANGEABLE VALVE SYSTEM FOR HYDRAULIC REVERSAL OF POSITIVE FEED DRILL

Pierre G. Vindez, Redondo Beach, Calif., assignor to P. V. Tool Inc, Gardena, Calif.

Filed Mar. 17, 1981, Ser. No. 244,673
Int. Cl.³ B23B *47/22;* **B23Q** *5/20*
U.S. Cl. 173—19 **2 Claims**



1. In a positive feed power drill having both a spindle drive gear train and a spindle feed gear train in a housing, and having hydraulic means for actuating a piston in a cylinder to the feed gear train for automatic retraction of the spindle, an improvement comprised of a valve in said hydraulic means utilizing a sleeve parallel to said spindle having only two axially displaced orifices, a first orifice connected to a passage from a source of fluid under pressure, and a second orifice connected to a passage from said sleeve to said cylinder to drive said piston therein, said valve having a valve stem with a reduced diameter portion between ends thereof, said reduced diameter portion being of a length sufficient to span both orifices, said valve stem having said reduced diameter portion at one end to span both orifices upon being moved in one direction, and further comprising valve actuating means at an upper end of said housing for moving said valve stem from a position having said reduced diameter portion over only orifice to a position over both orifices to automatically lock the feed gear train when the spindle has been driven a predetermined extent while countersinking, said one of two interchangeable valve stems being comprised of a collar supported on a shoulder of a spindle feed gear, and lever means over said collar for moving said valve stem in said opposite direction when said spindle feed gear causes said collar to move up on said spindle as said spindle feed gear threads upwardly on said spindle once said spindle is constrained from being fed further relative to said housing.

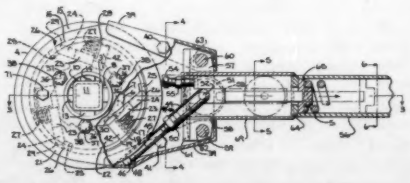
2. In a positive feed power drill having both a spindle drive gear train and a spindle feed gear train in a housing, and having hydraulic means for actuating a piston in a cylinder to the feed gear train for automatic retraction of the spindle, an improvement comprised of a valve in said hydraulic means utilizing a sleeve parallel to said spindle having only two axially displaced orifices, a first orifice connected to a passage from a source of fluid under pressure, and a second orifice connected to a passage from said sleeve to said cylinder to drive said piston therein, said valve having one of two interchangeable valve stems, each valve stem having a reduced diameter portion between ends thereof, said reduced diameter portion being of a length sufficient to span both orifices, one valve stem having said reduced diameter portion at one end to span both orifices upon being moved in one direction, and the other valve stem having said reduced diameter portion at the other end to span both orifices upon being moved in a direction opposite said one direction, and further comprising separate interchangeable valve actuating means at an upper end of said housing for moving said one of two interchangeable valve stems from a position having said reduced diameter portion over only one orifice to a position over both orifices to automatically lock the feed gear train when the spindle has been driven a predetermined extent while drilling and while countersinking, respectively, said one valve stem being selected for drilling with its relative valve actuating means, said valve actuating means for drilling being comprised of an arm extending from an upper end of said one valve stem and means adjusted in height on the upper end of said spindle corresponding to the extent of spindle travel desired before retraction for engaging said arm as said spindle is fed, thereby causing said spindle to be retracted when said arm is engaged by said means on said spindle, said other valve stem being selected for countersinking with its respective valve actuating means, said valve actuating means for countersinking being comprised of a collar supported on a shoulder of a spindle feed gear, and lever means over said collar for moving said valve stem in said opposite direction when said spindle feed gear causes said collar to move up on said spindle as said spindle feed gear threads upwardly on said spindle once said spindle is constrained from being fed further relative to said housing.

4,418,768

MANUAL TORQUE MAGNIFYING IMPACT TOOL

Oscar J. Swenson, 630 S. Poplar Way, Denver, Colo. 80224

Filed Sep. 2, 1982, Ser. No. 414,021
The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.
Int. Cl.³ B25P *15/02*
U.S. Cl. 173—93.5 **13 Claims**



1. A manually operable torque magnifying impact tool comprising a rotary tool head, an annular inertia member around said tool head on a common axis therewith, a frame member

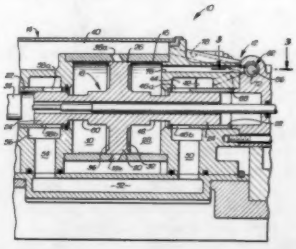
transverse the common axis at each end of the inertia member, a torque input handle extending transversely of said axis and connected to said frame member, bearing means coaxial with said axis and attached to said frame member guiding said tool head, inertia member, frame member and handle for relative angular movement about said axis, an elongated power spring within said handle, coupling means between said inertia member and said power spring for storing and releasing energy, said tool head including a cylindrical portion having a series of circumferentially equally spaced elongated ratchet teeth around its cylindrical surface parallel to said axis, a pawl pivotally seated at one edge in a seat on said inertia member, said pawl biased by pawl spring means for engagement of its unseated edge with said ratchet teeth, cam means rigid with said frame member around said axis operatingly contacting said pawl for its disengagement from and reengagement with said ratchet teeth to impart torque producing impact to said tool head on movement of said handle angularly in a predetermined direction about said axis relative to said tool head, a stop member on said frame member at times contacted forcibly by said unseated edge of said pawl following said disengagement of said pawl to stop rotation of said inertia member, a pivotal connection between said handle and same frame member to allow limited angular movement of said handle in one direction about said pivotal connection relative to said frame member about an axis parallel to the axis of said inertia member and remote from the longitudinal axis of said handle, said coupling means between said inertia member and said power spring including a spring stop member on said handle to limit decompressive movement of said power spring and including a pitman acting pivotally on said inertia member near the peripheral surface thereof and connected pivotally to a compression and recoil member in contact with said power spring, the combination of said pitman, said spring stop, and said compression and recoil member providing for compression and decompression of said power spring on said movement of said handle about said axis relative to said tool head in said predetermined direction, for interaction between said compression and recoil member and said handle on movement of the handle about said axis relative to said tool head in the direction opposite to the said predetermined direction to preclude forcible contact of said unseated end of said pawl with said stop on said frame member, and for said interaction responsive to said pivotal movement of the handle relative to said frame member following forcible engagement of said unseated edge of said pawl with said stop on said frame member to compress said power spring to stop rotation of said inertia member by absorbing kinetic energy of rotation therefrom.

4,418,769

HAMMER STARTING MECHANISM

Robert R. Vincent, Denver, and James T. Clemenson, Littleton, both of Colo., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 12, 1981, Ser. No. 243,076
Int. Cl.³ B25D *9/04*
U.S. Cl. 173—134 **7 Claims**



1. In a pneumatic hammer for repeatedly impacting a tool, said hammer having a housing which defines a chamber, a piston reciprocably carried within the chamber, said piston defining an impact subchamber of the chamber wherein pneumatic fluid supplied under pressure to the impact subchamber from an outside source drives the piston to impact the tool, the piston also defining a retracting subchamber of the chamber wherein pneumatic fluid supplied under pressure to the retracting subchamber drives the piston back from the tool, an exhaust port in the housing which provides an outlet from the chamber, said piston having a first position wherein the exhaust port is coupled to the impact subchamber so as to exhaust pneumatic fluid under pressure from the impact subchamber, a second position wherein the exhaust port is coupled to the retracting subchamber so as to exhaust pneumatic fluid under pressure from the retracting subchamber, and a third position intermediate the first and second positions in which the exhaust port is uncoupled from both subchambers, the improvement comprising:

a passageway located in the housing operably connecting one of the subchambers to an external outlet;

a valve located in the passageway, said valve having an open position in which said one subchamber is coupled through the open valve to the external outlet and a closed position in which the passageway is closed off;

means for biasing the valve in the open position at the start of the hammer operation wherein pneumatic fluid may be exhausted from said one subchamber to prevent the piston from centering in the intermediate position; and

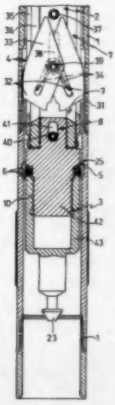
means for moving the valve from the open position to the closed position after the piston has started moving, said valve remaining in the closed position while the hammer is in operation.

4,418,770

PROCESS FOR RETRIEVING A CORING BARREL COMPRISING TWO TUBES AND RETRIEVING DEVICE FOR SUCH A PROCESS

Honore J. Lambot, Wauthier-Braine, Belgium, assignor to Societe Anonyme Diamant Boart, Brussels, Belgium

Filed Nov. 17, 1981, Ser. No. 322,130
Claims priority, application European Pat. Off., Nov. 21, 1980, 80201101.5
Int. Cl.³ E21B *49/00*
U.S. Cl. 175—58 **9 Claims**



1. A process for retrieving a double tube coring barrel including an outer tube (1) and an inner tube (2) which is pushed into a desired position, in an ascending boring, by a column of water acting on a sealing piston within the outer tube, the

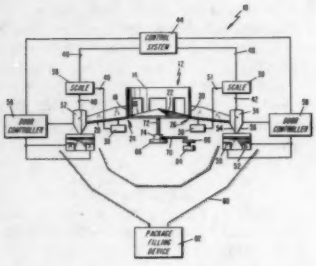
pressure in a lower part of the column being regulated above the hydrostatic pressure increased by the weight of said inner tube until said desired position is reached, comprising the steps of: increasing the pressure to circulate boring liquid toward a drilling crown and thereby take a core sample in the coring barrel, reducing the pressure in the lower part of the column to allow a retrieving head (3) to drop by gravity and seal off the outer tube, unclamping the inner tube of the coring barrel from the outer tube by allowing boring liquid in an upper part of the column to exert a traction force on the retrieving head, and allowing the unclamped inner tube and core sample to slide by gravity down through the outer tube to a retrieval site by draining boring liquid from the lower part of the column.

4,418,771

METHOD AND APPARATUS FOR COMBINATION WEIGHING

Nelson R. Henry, Decatur; Duncan B. Cutler, Dunwoody, and William L. Warner, Grayson, all of Ga., assignors to The Woodman Company, Decatur, Ga.

Filed Feb. 1, 1982, Ser. No. 344,630
Int. Cl.³ G01G *13/02*
U.S. Cl. 177—1 **26 Claims**



1. A method for making up a desired weight of a solid flowing product as a combination of contents of a predetermined number of storage cups comprising the steps of:

(a) establishing acceptable upper and lower limits for an acceptable range of product weight to be achieved;

(b) distributing quantities of the product to a plurality of scale hoppers;

(c) terminating the distribution of the product to each hopper in accordance with a determination by the scale associated therewith that a predetermined weight has been distributed thereto;

(d) feeding the product from each hopper to a storage cup associated with that particular hopper;

(e) registering the weight of product stored in each of the storage cups of the system;

(f) calculating the total weight of successive combinations of the registered product weights of said predetermined number of storage cups; and

(g) making the desired weight by selecting a combination of storage cups having a total product weight within the estalished acceptable limits.

4,418,772

COMBINATORIAL WEIGHING METHOD AND APPARATUS THEREFOR

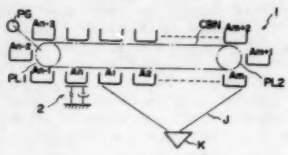
Masao Fukuda, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Apr. 13, 1982, Ser. No. 368,004
Claims priority, application Japan, Apr. 14, 1981, 56-56672
Int. Cl.³ G01G *13/00*
U.S. Cl. 177—1 **6 Claims**

1. A combinatorial weighing method in a combinatorial weighing apparatus of the type having a plurality of buckets for carrying articles to be weighed, a conveyor for conveying each of the buckets, and a weight sensor for sensing the weight of each bucket, which method comprises the steps of:

(a) storing in memory the empty weight of each bucket following the measurement thereof by the weight sensor;

(b) storing in memory the total weight of each bucket and the articles introduced into said bucket, said total weight of the bucket and its articles being measured by the weight sensor;



(c) producing a signal indicative of the weight of the articles in each bucket by subtracting from said total weight of the bucket and its articles the empty weight of the bucket;

(d) selecting the combination of articles whose overall weight is equal or closest to a preset target weight; and

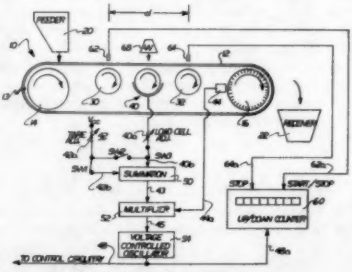
(e) releasing the selected articles from the buckets which carry them.

4,418,773

CONVEYOR CALIBRATION TECHNIQUE

Alain Finet, Newbury; Louis R. Nerone, Cleveland, and Michael J. Zenisek, Hiram, all of Ohio, assignors to Stock Equipment Company, Cleveland, Ohio

Filed Dec. 17, 1980, Ser. No. 217,241
Int. Cl.³ G01G *11/14, 23/14;* G01L *25/00;* B67D *5/08*
U.S. Cl. 177—16 **6 Claims**



1. For a bulk material weighing and metering conveyor of the endless belt type providing a belt speed pulse signal and a tare-adjusted bulk material weight analog signal, the speed signal and the adjusted weight signal being multiplied to provide a product signal that is converted into a periodic pulse signal of constant amplitude whose frequency indicates the feed rate (net weight per unit of time) of the material being metered by the conveyor, a method of tare weight calibration comprising the steps of:

counting the periods of the periodic pulse signal for at least one revolution of the empty conveyor belt without tare weight adjustment to the weight signal;

removing the weight signal and substituting in its place a preselected tare compensation signal;

counting the periods of the periodic pulse signal for at least one revolution of the conveyor belt with the tare compensation signal substituted in place of the weight signal without tare adjustment; and

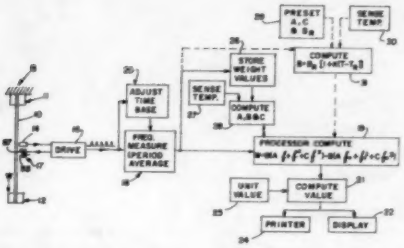
comparing the counts to determine the difference between them, the degree of difference between the counts indicating the accuracy of the tare compensation signal relative to the actual tare weight of the empty conveyor belt and related tare weight elements.

4,418,774

WEIGHT OR FORCE MEASURING APPARATUS

John A. Whitney; Daniel T. Dwyer, and Peter F. Sorenson, all of Fort Wayne, Ind., assignors to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Dec. 8, 1981, Ser. No. 328,746
Int. Cl.³ G01G 3/14, 21/10
U.S. Cl. 177—210 FP **10 Claims**



1. Apparatus for measuring a force, comprising a wire, support means rigidly supporting both ends of said wire, force receiving means connected to said wire and tensioning said wire along its length, the amount of said tension being a function of said force, vibration sensor-driver means mounted adjacent said wire for sensing the frequency of vibration of said wire and for driving said wire in vibration at substantially its natural frequency, and means connected to said support and said weight receiving means for damping and absorbing vibrations, said force receiving means comprising a movable support connected to said wire, pan support means adapted to receive said force to be measured, and said vibration damping and absorbing means including resilient means connecting said pan support means to said movable support, said movable support and said pan support having adjacent sides that are generally parallel to the length and the direction of tension of said wire, and said resilient means being between and attached to said parallel sides and said force is transferred by shear stresses.

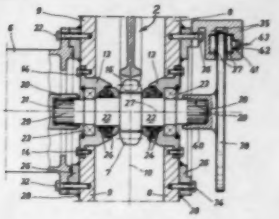
4,418,775

ENDLESS TRACK DRIVE DEVICE

Jean E. Leroux, Le Plessis Belleville, France, assignor to Poclain, Le Plessis Belleville, France

Filed Jul. 10, 1980, Ser. No. 168,252
Claims priority, application France, Jul. 24, 1979, 79 19064
Int. Cl.³ B62D 55/12
U.S. Cl. 180—9.62 **2 Claims**

1. A drive device for the endless tracks of a machine such as a hydraulic shovel, comprising endless tracks having driving fingers projecting therefrom, an endless track driving sprocket having a plurality of teeth along the external periphery thereof, a pinion having outer teeth cooperating with the plurality of teeth of said driving sprocket and said outer teeth having a shape corresponding to that of said driving fingers of said endless tracks, said driving sprocket being, on the one hand, mounted for rotation on a support secured to the chassis of the machine and being, on the other hand, coupled to a motor which is mounted on the said support and drives the sprocket in rotation by said pinion, said driving motor having an output shaft coupled to said pinion which is fixed against relative rotation with the pinion, and said driving pinion having a shaft having opposite ends, each of its ends having coupling areas adapted to be coupled selectively with said driving motor or



with a braking member to cooperate with the drive motor or braking member at the selection of the fabricator.

4,418,776

DRIVE UNIT FOR GOLF BAG CART

Richard A. Weirick, 3740 Sioux Ct., Grandville, Mich. 49418

Filed Jun. 22, 1981, Ser. No. 275,635
Int. Cl.³ B62D 51/04
U.S. Cl. 180—19 H **12 Claims**

1. A drive unit for a foldable golf bag cart having first and second legs, first and second axles extending horizontally from said first and second legs respectively, first and second wheels rotatably mounted on said first and second axles respectively, said cart being foldable between an operative position, wherein said wheels are spaced a fixed distance from one another, and a collapsed position, wherein said wheels are spaced a shorter distance from one another, said drive unit comprising:

a leg bracket adapted to be fixedly mounted on the first leg at approximately the same height as the top of the first wheel;

a motor having a rotatable drive shaft;

a pinion fixedly mounted on said shaft for rotation therewith;

battery means powering said motor;

a switch selectively actuating said motor;

means for supporting said motor on the first leg bracket, said supporting means being pivotal about said bracket between a first position when said cart is in said operative position, wherein said shaft is generally parallel to the first axle and said motor is located between the wheels and said pinion engages the ground-engaging surface of the first wheel, and a second position when said cart is in said collapsed position, wherein said drive unit is located out

of its first position between the wheels and does not interfere with the wheels of the cart; and

means for biasing said pinion against the first wheel when said supporting means is in said first position.

4,418,777

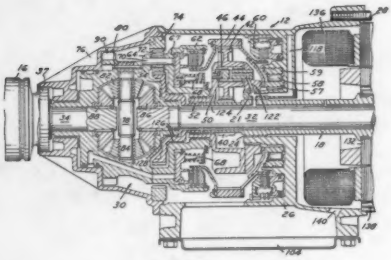
TRANSMISSION LUBRICATION AND MOTOR COOLING SYSTEM

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 11, 1981, Ser. No. 301,167

Int. Cl.³ H02K *9/00*

U.S. Cl. 180—65 E **7 Claims**



1. In an electric motor and mechanical transmission assembly, a system for supplying fluid that lubricates the transmission and cools the motor comprising:

a hollow rotor shaft connecting the rotor of the electric motor to the transmission input having radially directed holes located along its length;

a differential mechanism driven by the transmission adapted to transmit power to first and second driveshafts that extend outward from the differential mechanism, at least one of said drivenshafts and the rotor shaft defining an annular passage therebetween through which the fluid passes from the fluid source to the transmission and to the motor;

a multiple speed ratio power transmission connected to the driveshaft having fluid ducts connecting the annular passage to meshing gear surfaces and bearing support surfaces;

a source of pressurized fluid;

an electric motor having a rotor formed with an axially directed fluid duct and a radial duct for connecting the annular passage to the axial fluid duct, a stator winding located radially outward from and at axially opposite ends of the axial fluid duct and radially outward from the radially directed holes of the rotor shaft, whereby the fluid is thrown by centrifugal force from the annular passage through the radial holes of the rotor shaft and onto the surfaces of the stator winding and the fluid is forced by centrifugal force from the annular passage through the radially and axially directed fluid ducts of the rotor and onto the surfaces of the stator winding; and

passage means for directing fluid to a sump from which the source is supplied with fluid.

4,418,778

BATTERY OPERATED FORKLIFT WITH A MOTOR DRIVEN POWER STEERING SYSTEM

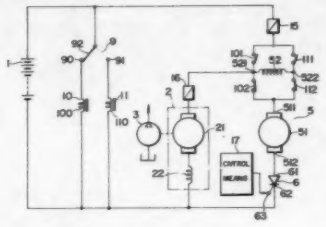
Norio Sato, Tachikawa, and Shohei Kamimoto, Musashimurayama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 27, 1981, Ser. No. 228,922

Claims priority, application Japan, Jan. 28, 1980, 55-7785

Int. Cl.³ B62D *5/06*

U.S. Cl. 180—132 **6 Claims**



1. An electrical system for a battery operated forklift comprising:

a storage battery;

a wheel drive motor including a field coil having a first and a second terminals and an armature having a first and a second terminals;

a power steering motor including a field coil and an armature;

a thyristor for controlling a current through said wheel drive motor, interposed between a negative terminal of the storage battery and said second terminal of the armature of said wheel drive motor;

a forward movement relay having a relay coil and normally open and normally closed relay contacts; a backward movement relay having a relay coil and normally open and normally closed relay contacts; and

a change-over switch having a movable contact and a pair of stationary contacts respectively connected to the relay coils of said forward movement relay and backward movement relay,

wherein the normally closed contact of said forward movement relay being connected between the first terminal of the field coil and the first terminal of the armature of said wheel drive motor, the normally open relay contact of said forward movement relay being connected between a positive terminal of said storage battery and the first terminal of the field coil of said wheel drive motor, the normally closed contact of said backward movement relay being connected between the second terminal of the field coil and the first terminal of the armature of said wheel drive motor, and the normally open relay contact of said backward movement relay being connected between the positive terminal of said storage battery and the second terminal of the field coil of said wheel drive motor, characterised in that the power steering motor is connected between the first terminal of the field coil of said wheel drive motor and the negative terminal of said storage battery.

4,418,779

CONTROL APPARATUS FOR VEHICLE STEERING SYSTEM

Masafumi Nakayama; Tokiyoshi Yanai, and Masato Fukino, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 27, 1982, Ser. No. 372,446

Claims priority, application Japan, Jun. 12, 1981, 56-90462

Int. Cl.³ B62D *5/08*

U.S. Cl. 180—141 **6 Claims**

1. A fluid-operated control apparatus for a power-assisted

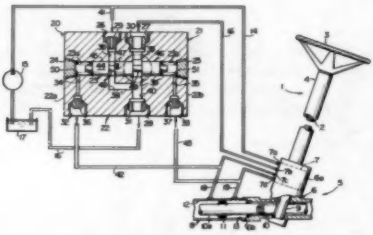
steering system including a steering wheel and shaft assembly rotatable about an axis therethrough in a steerable vehicle, comprising:

fluid-displacement means including a suction port to suck in supplied fluid and a delivery port to deliver fluid under pressure therefrom;

a steering pressure control valve responsive to turning motion of said steering wheel and shaft assembly and having fluid inlet and outlet ports respectively communicable with the delivery and suction ports of said fluid displacement means, and two control fluid ports, the control valve being shiftable between a condition providing communication between the fluid inlet and outlet ports and having said control fluid ports isolated from the fluid inlet and outlet ports, and a condition providing communication between the fluid inlet port and one of the control fluid ports and between the fluid outlet port and the other of the control fluid ports;

a steering power cylinder assembly comprising a housing and a piston connected to said steering wheel and shaft assembly and movable in the housing for having formed therein two pressure acting chambers separate from each other across the piston and respectively communicating with said control fluid ports; and

first and second fluid-flow control valves each having a valve casing portion formed with a cavity, a fluid inlet port and a fluid discharge port communicating with the suction port of said fluid displacement means, each of the fluid-flow control valves comprising (1) differential pressure producing means operative to develop in said cavity a differential pressure



continuously variable with a differential pressure between the pressure acting chambers of the cylinder assembly, (2) a valve member movable in said cavity and responsive to the differential fluid pressure developed by said differential pressure producing means, and (3) biasing means urging the valve member to stay in a predetermined equilibrium position in the cavity in the absence of a differential fluid pressure acting thereon for providing full communication between the fluid inlet and discharge ports of each fluid-flow control valve when the valve member is in the equilibrium position thereof and being movable from the equilibrium position a distance which is continuously variable with the differential fluid pressure acting on the valve member;

the fluid inlet port of the first fluid-flow control valve being in constant communication with the delivery port of said fluid displacement means and with the fluid inlet port of said steering pressure control valve, and the fluid inlet port of the second fluid-flow control valve being in constant communication with the fluid outlet port of the steering pressure control valve,

the valve member of the first fluid-flow control valve being operative to block the communication between the fluid inlet and discharge ports of the first fluid-flow control valve when the differential fluid pressure acting thereon is higher than a first predetermined value and the valve member of the second fluid-flow control valve being operative to block the communication between the fluid inlet and discharge ports of the second fluid-flow control valve when the differential fluid pressure acting thereon is higher than a second predetermined value,

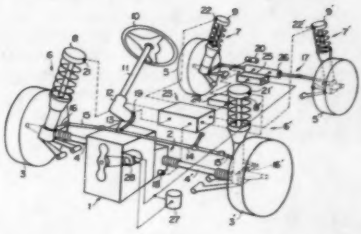
said second fluid-flow control valve further comprising bypass means providing constant communication between the fluid outlet port of said steering pressure control valve and the suction port of said fluid displacement means without respect to the position of the valve member of the second fluid-flow control valve in the cavity thereof.

4,418,780

METHOD OF STEERING A WHEELED VEHICLE HAVING AT LEAST TWO PAIRS OF STEERABLE ROAD WHEELS

Hideo Ito, Zushi, and Keiichiro Yabuta, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 15, 1981, Ser. No. 273,971
Claims priority, application Japan, Jun. 24, 1980, 55-84519
Int. Cl.³ B62D 5/04
U.S. Cl. 180—142 **2 Claims**



2. A control device for controlling a steering system of a wheeled vehicle having a first pair of steerable road wheels to be steered by human intervention, a second pair of steerable road wheels to be steered in response to a steering effort applied to the first pair of steerable road wheels, a first wheel axle operatively connected to the first steerable road wheels, and a second wheel axle operatively connected to the second steerable road wheels, comprising:

a hydraulic drive system which is adapted to develop a fluid pressure variable with a control signal applied thereto and which is operatively connected to the second pair of steerable road wheels for driving the second pair of steerable road wheels to veer through an angle variable with the fluid pressure,

first means having registered therein values respectively representative of the total sprung mass and the wheel base of the vehicle and the cornering powers of the tires of the first and second steerable road wheels;

second means operative to detect the vehicle speed and to produce an output signal representative of the detected vehicle speed;

third means operative to detect the sprung mass carried by each of the first steerable road wheels and to produce a second signal representative of the detected sprung mass of each of the first steerable road wheels;

fourth means operative to determine the distance between the center of gravity of the vehicle and the center axis of said first wheel axle on the basis of the output signal from the third means and to produce an output signal representative of the distance thus determined;

fifth means operative to detect the sprung mass carried by each of the second steerable road wheels and to produce an output signal representative of the detected sprung mass of each of the second steerable road wheels;

sixth means operative to determine the distance between the center of gravity of the vehicle and the center axis of said first wheel axle on the basis of the output signal from the

fifth means and to produce an output signal representative of the distance thus determined; and

seventh means responsive to the respective output signals from the second, fourth, and sixth means for calculating the ratio k between the angle through which the second pair of steerable road wheels is to be steered versus the angle through which the first pair of steerable road wheels is steered, producing an output signal representative of the ratio k thus calculated and supplying the last named signal to said hydraulic drive system as said control signal, the seventh means being operative to calculate said ratio k on the basis of said respective output signals and said values registered in said first means in accordance with the equation

$$k = \frac{b \cdot l - M \cdot V^2 (a/C_r)}{a \cdot l + M \cdot V^2 (b/C_f)}$$

wherein M is the total sprung mass of the vehicle as registered in said means, V is the vehicle speed represented by the output signal from said second means, a is the distance represented by the output signal from said fourth means, b is the distance represented by the output signal from said sixth means, C_f is the cornering power of the tire of each of said first steerable road wheels as registered in said means, C_r is the cornering power of the tire of each of said second steerable road wheels as registered in said first means, and l is the wheel base of the vehicle as registered in said first means.

4,418,781

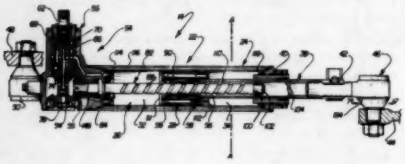
STEERING APPARATUS

William T. Rabe, and Maurice P. Roberts, both of Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio

Filed Jun. 10, 1982, Ser. No. 386,907

Int. Cl.³ B62D *5/10*

U.S. Cl. 180—155 **24 Claims**



1. An apparatus for use in turning steerable vehicle wheels, said apparatus comprising

wall means for defining a chamber,

a piston disposed in said chamber and having first and second end portions, said first end portion of said piston having a first working area,

a hollow piston rod connected to said second end portion of said piston, said second end portion of said piston having a second working area disposed outside of said piston rod and a third working area at least partially enclosed by said piston rod, the difference in area between said first and third working areas being equal to the sum of said second and third working areas, and

valve means operable to a first condition to direct fluid pressure against said first and third working areas to effect turning movement of the steerable vehicle wheels in a first direction, said valve means being operable to a second direction to direct fluid pressure against said second and third working areas to effect turning movement of the steerable vehicle wheels in a second direction.

4,418,782

GUARD DEVICE OF SNOWMOBILE AGAINST SPLASHES OF SNOW

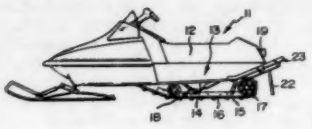
Masatoshi Nakazima, Iwata, Japan, assignor to Yamah Motor Co., Ltd., Iwata, Japan

Filed Apr. 20, 1981, Ser. No. 255,737

Claims priority, application Japan, Apr. 18, 1980, 55-52000

Int. Cl.³ B62D *25/16*

U.S. Cl. 180—190 **4 Claims**



1. A protective device for the rear of a snowmobile or the like having a body and a driving tread, said body being configured so that the rear portion of said driving tread is substantially exposed, said protective device comprising a rigid splash guard fixed to the body of the snowmobile contiguously to the exposed rear portion of the driving tread and extending rearwardly and upwardly therefrom a sufficient distance to prevent snow thrown from the driving tread from impinging on the rear of said body and a flexible flap affixed relative to said splash guard forwardly of the rearwardmost termination thereof and depending therefrom.

4,418,783

TRACTOR

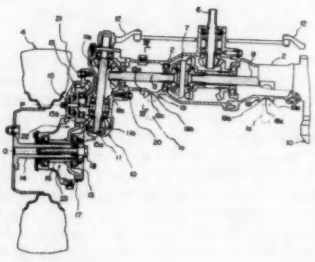
Akira Teraoka, Osaka, and Tadashi Nakamura, Kawachinagano, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Apr. 20, 1982, Ser. No. 370,068

Claims priority, application Japan, Sep. 2, 1981, 56-130785[U]

Int. Cl.³ B60K *17/00*

U.S. Cl. 180—209 **3 Claims**



1. A tractor comprising:

a front axle case (2) incorporating a differential gear (7) and front wheel driving shafts (8);

steering cases (10) incorporating transmission shafts (11) for transmitting power from said front wheel driving shafts (8), said steering cases (10) removably connected to said front axle case (2);

front wheel housings (13) incorporating gear transmission mechanisms (22) interlockingly connected to said transmission shafts (11), said housings (13) connected to said steering cases (10) such that the mounting positions of said housings (13) can be changed around the gear rotating centers (P) of said gear transmission mechanisms (22);

front axles (14) adapted to receive power from said gear transmission mechanisms (22) and attached to said front wheel housings (13) such that said axles (14) can move in the axial

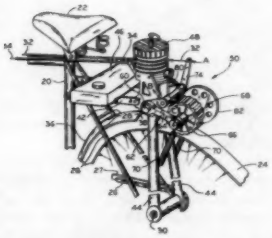
directions (Q) thereof and their relative positions with respect to said housings (13) can be fixed;
front wheels (4) fixed to said front axles (14);
rear axle cases (2') incorporating rear wheel driving shafts (31);
rear wheel housings (33) incorporating gear transmission mechanisms (32) interlockingly connected to said rear wheel driving shafts (31), said housings (33) connected to said rear axle cases (2') such that the mounting positions of said housings (33) can be changed around the gear rotating centers (P') of said gear transmission mechanisms (32);
rear axles (30) adapted to receive power from said gear transmission mechanisms, said rear axles (30) attached to said housings (33) such that said rear axles (30) can move in the axial directions (Q') thereof and their relative positions with respect to said housings (33) can be fixed; and
rear wheels (5) fixed to said rear axles (30);
said front axle case (2) and said rear axle cases (2') provided at the lower sides thereof with semi-circular projections (19, 19') separated from each other in the axial direction of said cases (2, 2').

4,418,784

BICYCLE TRANSMISSION ASSEMBLY

Duke Fox, 5305 Towson Ave., Fort Smith, Ak. 72901

Filed Jan. 26, 1982, Ser. No. 342,820
Int. Cl.³ B62M *13/04*
U.S. Cl. 180—221 **15 Claims**



11. A crank shaft-to-tire drive system comprising power means for driving said crnak shaft for generating motive forces for driving a tire, cleated roller means resting on a surface of said tire with a pressure adequate to distort that surface of said tire to form a bulge on the surface of said tire which bulge rises into valleys between the cleats on said roller wherein said cleats are separated from each other by distances which substantially maximize the slope angle of said bulge, means for transferring the motive forces from said power means crank shaft to said roller means, and means for moving said cleated roller means over an arc centered on said crank shaft and into and out of engagement with said tire surface, whereby said motive forces are clutched and declutched.

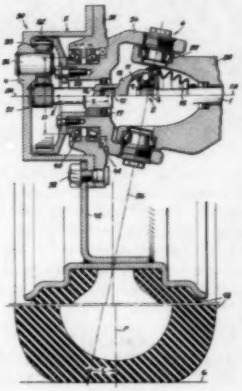
4,418,785

STEERED AND DRIVEN AXLE-END ASSEMBLY

Friedrich Ehrlinger, Friedrichshafen; Peter Dziuba, Ueberlingen; Dieter Maurer, and Manfred Goeft, both of Friedrichshafen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,280
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930298
Int. Cl.³ B60K *17/30*
U.S. Cl. 180—255 **1 Claim**

1. A steered and driven axle-end assembly comprising:
an inside knuckle half;
an outside knuckle half pivotal on said inside half about an upright pivot axis;
an axle extending into said inside knuckle half;
a universal joint having an inner side connected in said inside knuckle half to said axle and an outer side;
a wheel support rotatable about a horizontal wheel axis;
a wheel mounted on said support and having a periphery engageable with the ground and centered on a wheel plane perpendicular to said wheel axis, said pivot axis crossing said plane radially within said periphery;
a pair of tapered-roller bearings centered on said wheel axis and having centers spaced axially apart therealong by a spacing equal to at most half of the axial distance between the intersections of their contact angles and said wheel axis, said roller bearings rotatably supporting said wheel support on said outer knuckle half; and



stepdown gearing connecting said outer side of said universal joint to said wheel support for rotation of said wheel support and said wheel by said axle at a substantially lower rate than said axle, said universal joint, outside knuckle half, and wheel support lying wholly within the vertical projection of said wheel, said gearing including:
a large-diameter driven gear fixed on said support and centered on said axis and a small-diameter drive gear fixed on said outer side of said universal joint, and
two further gears flanking said small gear and both meshing with said small gear and with said large gear, whereby said small gear meshes via said further gears with said large gear.

4,418,786

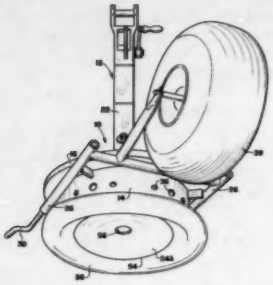
BOTTOM DIAPHRAGM FOR TRANSPORTER FOR A SEISMIC ENERGY SOURCE

Philip N. Martin, Tulsa, Okla., assignor to Mapco, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 188,370, Sep. 18, 1980, Pat. No. 4,334,591, which is a continuation-in-part of Ser. No. 963,982, Nov. 27, 1978, Pat. No. 4,223,759. This application Jun. 11, 1981, Ser. No. 272,772
Int. Cl.³ G01V *1/104*
U.S. Cl. 181—116 **7 Claims**

1. An improved portable seismic energy source comprising:
a base member having sidewalls, a lower end for resting on the earth's surface and a horizontal baseplate secured to the upper end, the base member having an open bottom and an opening in the horizontal baseplate;
a gun mounted on said horizontal baseplate for firing a projectile through the opening therein to impact the earth's surface and generate a seismic signal;
a spatter plate having an upper surface and a lower surface and an opening therethrough, the spatter plate having outside dimensions less than said base member and being

mounted within said base member and having the lower surface spaced above the base member bottom so that the spatter plate is supported above the earth's surface, the spatter plate having a central opening therein in alignment with said baseplate opening; and



a diaphragm of flexible material secured to the periphery of said base member lower end, the diaphragm having a central opening therein and the central portion thereof surrounding the opening being received on the upper surface of said spatter plate, the diaphragm and spatter plate serving to intercept gases, liquids and solids ejected when a projectile engages the earth.

4,418,787

HEARING AID WITH AUDIO PATH DUCT EXTENSION ELEMENT, AND EXTENSION ELEMENT ATTACHMENT

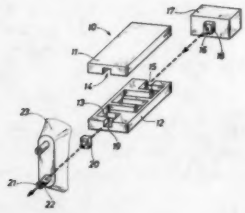
Albert Eggert; Erwin Gahleitner, and Joachim Kwiatkowski, all of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 23, 1981, Ser. No. 276,520

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023871

Int. Cl.³ H04R *25/00*

U.S. Cl. 181—130 **15 Claims**



9. In combination with, a hearing aid having,

a sound receiving structure,

a sound processing structure, separable from the sound receiving structure and means for defining a sound duct or audio path between the sound receiving structure and the sound processing structure, and

a removable acoustic path extension element comprising

an acoustic wave guide element defining a tortuous or labyrinthine or sinuous audio path for sound transmitted therethrough, said element being an elongated body of plastic material having therein a groove or duct longer than the length of said elongated body;

said acoustic wave guide element being formed with sound entrance and exit openings which are positioned in axial alignment, at respective end portions of the elongated body;

and wherein said sound receiving structure and said sound processing structure, respectively, is formed with sound receiving openings in matching position with said sound entrance and exit openings of the acoustic wave guide element.

4,418,788

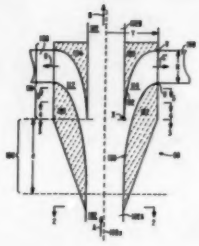
BRANCH TAKE-OFF AND SILENCER FOR AN AIR DISTRIBUTION SYSTEM

Dimiter Gorchev, Boston, Mass.; Karl U. Ingard, Kittery Point, Me., and Herbert L. Willke, Jr., Cambridge, Mass., assignors to Mitco Corporation, Somerville, Mass.

Filed Apr. 13, 1981, Ser. No. 253,270

Int. Cl.³ E04F *17/04*

U.S. Cl. 181—224 **5 Claims**



1. A branch take-off and silencing device for coupling an airstream from an input duct to a coaxial output duct and one or more branch ducts angularly offset from said input and output ducts, comprising:

A. a static pressure regain (SPR) section including

i. an input port having a cross-section substantially the same as the cross-section of said input duct, and adapted to receive substantially all the air in said airstream,

ii. an output port having a cross-section including at least two parts, the first of said parts being substantially the same as the cross-section of said output duct and the second of said parts being substantially the same as the cross-section of an associated channel, wherein said second part is contiguous to said first part,

iii. a first airflow means for passing a first portion of said received air through said first part to said output duct,

iv. a second airflow means including an SPR outer wall means for passing a second portion of said received air through said second part to said associated channel,

B. a channel section including

i. a central duct and associated output port coaxial with and having the same cross-section as said input and output ducts, said central duct adapted for coupling at said output port to said output duct,

ii. channel means including inner and outer path defining walls for defining a perimeter channel between said second part of said SPR section output port and an associated branch duct, said perimeter channel having the same cross-section as said second part at its upstream end, and having the same cross-section as said associated branch duct at its downstream end,

wherein said SPR outer wall and said outer path-defining wall have a composite cross-section characterized by a continuous curve, wherein said inner path-defining wall has a cross-section characterized by a continuous curve, said continuous curves having a direction component radially away from the central axis of said input duct, and being parallel to the central axis of said input duct at its downstream end, and being parallel to the central axis of said branch duct at its upstream end,

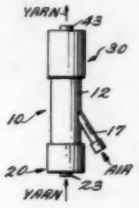
wherein said SPR outer wall and said inner and outer path-defining walls are made of acoustical material.

4,418,789

MUFFLER FOR A TEXTILE INTERLACING JET

Wayne L. Eckert, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 8, 1982, Ser. No. 356,143
Int. Cl.³ F01N 1/08
U.S. Cl. 181—255 **10 Claims**



1. A textile interlacing jet comprising:
a main interlacing body portion including a yarn inlet at a first end thereof, a yarn outlet at a second end thereof, and an air inlet intermediate said yarn inlet and outlet, said yarn inlet and outlet being connected by a continuous passageway;
first reactive muffler means disposed in operative association with said body portion first end and including an expansion chamber having a substantially larger cross-sectional area than said yarn inlet, and further including a restricted inlet to said expansion chamber, said restricted inlet being large enough for free passage of yarn therethrough, but providing an abrupt cross-sectional area change with said expansion chamber, the ratio of the cross-sectional area of said expansion chamber to that of said restricted inlet being at least about 9:1; and
second reactive muffler means disposed in operative association with said body portion second end and including an expansion chamber having a substantially larger cross-sectional area than said yarn outlet, and further including a restricted outlet therefrom, said restricted outlet being large enough for free passage of yarn therethrough, but providing an abrupt cross-sectional area change with said expansion chamber, the ratio of the cross-sectional area of said expansion chamber to that of said restricted outlet being at least about 9:1.

4,418,790

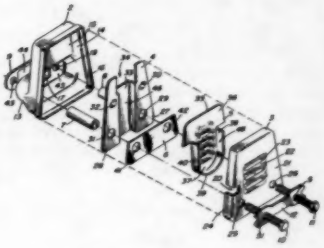
METHOD AND APPARATUS FOR ATTENUATING SOUND

Ralph E. Agnew, Gardena, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Nov. 18, 1981, Ser. No. 322,561
Int. Cl.³ F01N 1/08
U.S. Cl. 181—268 **10 Claims**

1. A method of attenuating sound levels of exhaust gas issuing from engine exhaust systems, said method comprising:
transmitting a flow of engine exhaust gas into muffler means;
splitting said exhaust gas flow into first and second, flow paths within said muffler means;
recombining exhaust gas from each of said first and second flow path within said muffler means by
flowing gas from each of said first and second flow paths generally toward and into each other as mutually opposed gas flows to form a unified exhaust gas flow; and
alternately compressing and expanding said exhaust gas flow while concurrently
permitting increments of said exhaust gas flow to exit from said muffler means, sequentially along the flow of said exhaust gas flow(.);
said alternate compression and expansion of said exhaust gas flow comprising
passing said exhaust gas flow generally transversely of the general direction of the exit flow direction of said exhaust gas,
sequentially and repeatedly restricting and expanding said flow of exhaust gas as said flow passes generally transversely of said general direction of exit flow, and
effecting sequential exiting of said exhaust gas at locations spaced along, and directed transversely of, said flow of exhaust gas effecting said alternate compression and expansion.

6. Apparatus for attenuating sound levels of exhaust gas issuing from engine exhaust systems, said apparatus comprising muffler means including:
means for receiving a flow of engine exhaust gas;
means for splitting said exhaust gas flow into first and second flow paths within said muffler means;
means for recombining exhaust gas from each of said first and second flow path within said muffler means by



flowing gas from each of said first and second flow paths generally toward and into each other as mutually opposed gas flows to form a unified exhaust gas flow;
means for alternately compressing and expanding said exhaust gas flow while concurrently
permitting increments of said exhaust gas flow to exit from said muffler means, sequentially along the flow of said exhaust gas flow;
said means for alternately compressing on and expanding said exhaust gas flow comprising
means for passing said exhaust gas flow generally transversely of the general direction of the exit flow direction of said exhaust gas,
means for sequentially and repeatedly restricting and expanding said flow of exhaust gas as said flow passes generally transversely of said general direction of exit flow, and
means for effecting sequential exiting of said exhaust gas at locations spaced along, and directed transversely of, said flow of exhaust gas affecting said alternate compression and expansion.

4,418,791

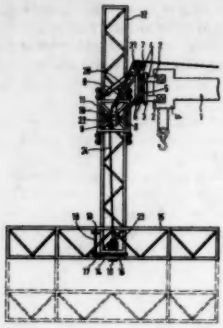
DEVICE FOR ENHANCING THE VERSATILITY OF CRANES OR THE LIKE

Paul Frey-Wigger, Am Zeigerwald, CH-6247 Schötz, Switzerland

Filed Mar. 26, 1981, Ser. No. 247,754
Claims priority, application Switzerland, Mar. 27, 1980, 2414/80
Int. Cl.³ B66F 9/06, 11/04
U.S. Cl. 182—2 **21 Claims**

1. In a crane or an analogous machine, the combination of a boom having a free end portion; a pivot bearing mounted on said end portion; a second bearing turnable in said pivot bear-

ing about a substantially horizontal axis; an elongated column mounted in and movable up and down relative to said second bearing at a plurality of speeds; carrier means adjacent to said second bearing; means for monitoring the speed of downward movement of said column relative to said second bearing and said carrier means; braking means mounted on said carrier means, connected with said monitoring means and operable to



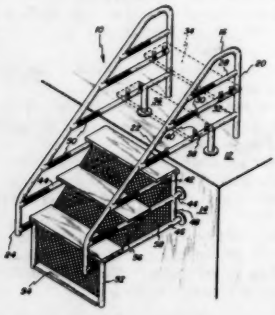
arrest said column when the speed of downward movement of said column rises to a preselected value whereby said carrier means moves relative to said second bearing during deceleration of said column; and shock absorber means interposed between said second bearing and said carrier means to yieldably oppose the movement of said carrier means with reference to said second bearing.

4,418,792

POOL LADDER

Daniel J. Cerone, 17 Bluebird Ct., Waterford, N.Y. 12188

Filed Mar. 3, 1982, Ser. No. 354,178
Int. Cl.³ E06C 9/00
U.S. Cl. 182—93 **14 Claims**



1. A pool ladder to facilitate the downward movement of an individual from a wheelchair which is positioned on a plane surface, such as a pool deck, into a pool comprising:

means for supporting a plurality of steps in the form of a flight of stairs running downwardly from a top step into the pool, the top step being at a position accessible from a wheelchair on the deck;

a top step connected to the support means, said top step positioned to be accessible from a wheelchair on the deck and at a height above the deck approximately equal to the height of a wheelchair seat; and

a plurality of steps which, together with the top step, form a flight of stairs running downwardly into the pool.

4,418,793

LADDER AID DEVICE

William E. Brent, 1 Forest Hill Dr., Taylors, S.C. 29687

Filed Apr. 13, 1981, Ser. No. 253,201
Int. Cl.³ E06C 7/14
U.S. Cl. 182—129 **2 Claims**

1. In combination with a stepladder of the type having pairs of opposed side legs which pivot from a top platform of the ladder and foldable braces which unfold to brace between front and back side legs to maintain said ladder in a free upstanding configuration, an accessory device comprising:

sleeve means having an elongated bore extending therethrough open on distal ends of said sleeve means;

attachment means for fixably attaching said sleeve means to one of said ladder legs;

a support member slidably received in said bore of said sleeve means;

said bore of said sleeve means being defined by walls which intersect one another at well defined angles;

said support member including an elongated shank portion generally corresponding in shape with said elongated bore, said shank portion having surfaces intersecting each other at complementary angles to the defined angles of said elongated bore so as to prevent said shank portion from turning in said bore;

interlock means for fixing the position of said support member in said sleeve means;

tray means carried by said support member for supporting a work article and the like;

said tray means and including an open top tray having side walls forming a box and a side portion having a wall with a slot therein for receiving and holding elongated tools and being supportable in a plurality of positions to support said article at a desired height;

said interlock means setting and fixing said support members at an infinite number of continuous positions over the length of said support member facilitating adjustment of said support member to hold an article supported on said tray means firmly against an associated structure in a clamping manner.

4,418,794

ELECTROMECHANICAL CONTROL FOR HYDRAULIC ELEVATORS

Giuseppe Manco, Carugate, Italy, assignor to Otis Elevator Company, Farmington, Conn.

Filed Mar. 11, 1982, Ser. No. 357,005
Claims priority, application Italy, Jun. 16, 1981, 22355 A/81
Int. Cl.³ B66B 1/04
U.S. Cl. 187—17 **13 Claims**

1. Apparatus for controlling the flow of a fluid between a pump, a tank containing the fluid, and a cylinder containing a piston that moves in response to the flow of the fluid in and out of the cylinder, characterized by:

a bypass valve having an inlet port for receiving fluid from the pump and an outlet port connecting with the tank, said valve being biased to provide progressively more bypass

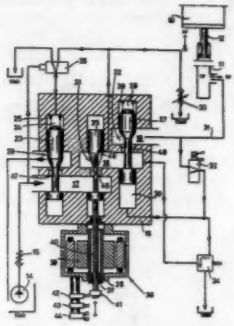
flow to the tank in direct proportion to the fluid pressure in the inlet port from the pump;

an adjustable valve having an inlet port for receiving fluid flow from the inlet port of the bypass valve and an outlet port, said first adjustable valve being adjustable to meter the fluid that flows between its inlet port and its outlet port;

an electric motor for adjusting the adjustable valve;

a second bypass valve having an inlet port that is connected to the outlet port of said adjustable valve and an outlet port, said second bypass valve being biased to provide progressively more flow between its inlet port and outlet port as the pressure in the inlet port increases;

a first control valve for applying fluid pressure to the bypass valve to decrease the bypass flow in proportion to the fluid pressure in the outlet of the adjustable valve; and



a second control valve that is selectively operable for applying fluid pressure to the second bypass valve to open the second bypass valve in direct proportion to the fluid pressure in the cylinder;

whereby said apparatus allows, when the pump is operating, fluid to flow from the pump through the bypass valve, the adjustable valve and the second bypass valve to the cylinder, whereby the piston is moved in one direction; whereby, upon the operation of the second control valve, when the pump is not operating, the second bypass valve is moved to a position at which fluid may flow from the cylinder through the second bypass valve, the adjustable valve and the bypass valve to the tank to move the piston in the opposite direction; and whereby the motion of the piston in each direction can be controlled by the operation of the electric motor.

4,418,795

ELEVATOR SERVICING METHODS AND APPARATUS

William J. Trosky, Pittsburgh; Kenneth M. Eichler, N. Versailles; Alan F. Mandel, Scott Township, Allegheny County, all of Pa., and William H. Moore, Bridgewater, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 20, 1981, Ser. No. 284,843

Int. Cl.³ B66B *3/00*

U.S. Cl. 187—29 R **28 Claims**

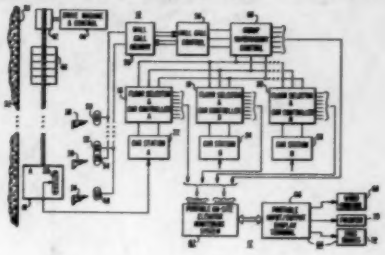
1. A method of servicing an elevator system having a plurality of control elements operable between first and scond states, comprising the steps of:

providing monitoring means having storage means and a plurality of input leads,

storing definitions in the storage means to said monitoring means for at least certain ones of said plurality of input leads, with each of said definitions being associated with a control element of the elevator system,

selecting which control elements of the stored definitions, and the states thereof, are to signify the occurrence of an event by the simultaneous occurrence of the specified states,

connecting said at least certain ones of said plurality of input leads to be responsive to the state of the associated control element set forth in the storing step,



detecting the occurrence of the event defined in the selecting step,

storing the fact that the event occurred,

and reproducing the information stored by the storing step relative to the occurrence of the event.

4,418,796

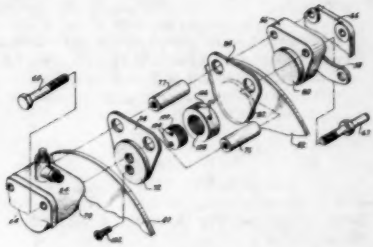
TRANSMISSION AND DISC BRAKE

Udo Rittmann, Mulheim, Fed. Rep. of Germany, assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 29, 1979, Ser. No. 7,483

Int. Cl.³ F16D *55/36*

U.S. Cl. 188—71.5 **8 Claims**

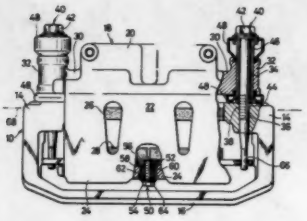


1. A brake system for a vehicle having an axle housing, two independently driven wheels and two opposed shafts in alignment with one another and operatively connected to separate wheels: said system comprising a brake disc mounted on one of said opposed shafts, a second disc mounted on the other of said opposed shafts, said discs being movable axially relative to one another, a brake actuator disposed at one side of said first disc and rigidly connected to said housing, a puck disposed between said actuator and said first disc for engagement therewith, first and second support members slidably disposed between said discs and movable relative to one another, support means for said members, a puck on said first member for engagement with said first disc, a puck on said second member for engagement with said second disc, an abutment disposed on the side of said discs opposite said actuator, and an adjustment means disposed between said support members and having a threaded hub mounted on one of said members and a ring threadedly mounted on said hub and movable axially thereon and being operatively connected to both of said support members when said brake actuator is energized for varying the minimum spacing between said members to compensate for wear in said pucks resulting from actuating of the brakes.

4,418,797
SLIDING CALIPER DISC BRAKES

Fumio Fujimori, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 18, 1981, Ser. No. 274,887
Claims priority, application Japan, Jun. 26, 1980, 55-88084
Int. Cl.³ F16D *65/02*
U.S. Cl. 188—73.37 **4 Claims**

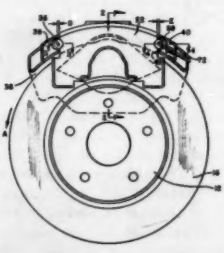


1. A sliding caliper disc brake comprising:
a rotatable disc;
a torque plate member fixed to a body of a vehicle;
a caliper member straddling a minor portion of said rotatable disc and slidably carried on said torque plate member, said caliper member having fluid actuated means for urging an inner pad means onto one side of said disc by direct contact therewith and for urging an outer pad means onto the other side of said disc by movement of said caliper relative to said torque plate member, said inner and outer pad means being disposed in slidable direct torque transmitting contact with said torque plate member; and
connection means for connecting said outer pad means to said caliper member, said connection means comprising an aperture in said torque plate member, a bolt threaded into said outer pad means and passing through said aperture of said torque plate member, and an elastic bushing disposed between said bolt and said torque plate member in said aperture to ensure a close fitting of the bolt in the aperture and to absorb vibration.

4,418,798
DISC BRAKE WITH WEDGE PINS

Donald D. Johannesen, and Raymond P. Haluda, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 192,112, Sep. 29, 1980, abandoned. This application Oct. 12, 1982, Ser. No. 433,576
Int. Cl.³ F16D *65/02*
U.S. Cl. 188—73.45 **5 Claims**

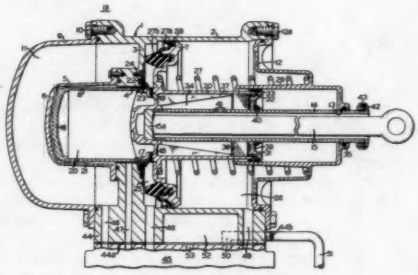


1. A disc brake comprising a rotor having friction faces on opposite sides thereof and rotatable about an axis perpendicular to the plane of said rotor, a caliper cooperating with a pair of friction elements to urge the latter into engagement with the friction faces on the rotor to retard rotation of said rotor, a non-rotating torque member carrying said caliper in a substantially fixed radial and circumferential position relative to said rotor, said caliper and said torque member having axially-extending grooves in registry, said grooves cooperating to define an axially-extending aperture between said caliper and said torque member, an elongated pin slidably received in said axially-extending aperture for the purpose of movably supporting said caliper relative to said torque member, said pin substantially coinciding in shape to said axially-extending aperture, reilient means engaging said pin for moving said pin within said axially-extending aperture, characterized in that said pin includes a pair of wedge-defining members which slidably engage each other at a wedge surface on each member, said resilient means moving said wedge-defining members relative to each other so as to wedge the members together between said caliper and said torque member in order to accommodate manufacturing tolerances between said caliper and said torque member.

4,418,799
COMBINED AIR RESERVOIR/BRAKE CYLINDER DEVICE

James E. Hart, Trafford; Willard P. Spalding, Penn Hills, and Allen W. Kyllonen, Plum, all of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Aug. 7, 1981, Ser. No. 290,756
Int. Cl.³ B60T *11/10*
U.S. Cl. 188—153 R **43 Claims**



1. A fluid pressure actuator device comprising:
(a) a cylinder including application and release portions;
(b) a piston slidably operable in said cylinder between application and release positions, said piston including a push rod having one end engageable with said piston and the other end arranged to operate working apparatus;
(c) first seal means engaging said piston and said cylinder for separating said cylinder into said respective application and release portions on opposite sides of said piston;
(d) second seal means for separating said application portion into an application chamber that delimits an application pressure area on one side of said piston and a positioning chamber that delimits a positioning pressure area of said piston on the same side thereof as said application pressure area;
(e) third seal means for forming a release chamber in said release portion of said cylinder that delimits a release pressure area of said piston on the side opposite said one side and for establishing a return pressure area on said opposite side of said piston external to said release chamber;
(f) means for introducing fluid under pressure to said release chamber to urge said piston toward said release position;
(g) means for introducing fluid under pressure to said application chamber to urge said piston toward said application position; and
(h) means for introducing fluid under pressure to said posi-

tioning chamber to urge said piston toward said application position.

4,418,800

MOTORCYCLE BRAKING SYSTEM HAVING LOAD SENSITIVE PRESSURE CONTROL VALVE

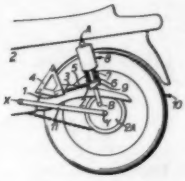
Wolfgang Hess, Koblenz, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Filed Jun. 8, 1981, Ser. No. 271,104

Claims priority, application United Kingdom, Jun. 12, 1980, 8019269

Int. Cl.³ B60T 8/22

U.S. Cl. 188—195 **6 Claims**



1. A control valve arrangement for a braking system of a motorcycle having a manually adjustable suspension strut connected between the sprung and unsprung parts of the motorcycle, the strut having an adjustable spring support for a suspension spring, said arrangement comprising a control valve for controlling fluid pressure applied to a wheel brake, the control valve being separate from the strut and being rigidly mounted on the frame of the motorcycle, and coupling means connected between the control valve and the adjustable spring support applying a force to the control valve, the coupling means including a tension spring operable to vary the force applied to the control valve in dependence upon the relative position of the sprung and unsprung parts of the motorcycle.

4,418,801

RAIL VEHICLE SLACK ADJUSTER

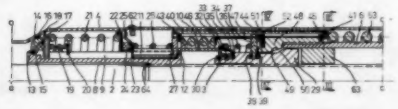
Lars M. Severinsson, Hishult; Peter Beijbom, Lund, and Anders K. Martensson, Bjärred, all of Sweden, assignors to SAB Industri AB, Landskrona, Sweden

Filed Jun. 10, 1981, Ser. No. 272,181

Claims priority, application Sweden, Jun. 24, 1980, 8004670

Int. Cl.³ F16D 65/66

U.S. Cl. 188—202 **1 Claim**



1. A rail vehicle slack adjuster of the axial type, comprising an elongated barrel, a non-rotatable pull means extending out of the barrel from one of its ends, a non-rotatable spindle extending out of the barrel from its opposite end, a barrel spring of the helical compression type acting between the barrel and the pull means, and an adjuster nut in non-self-locking engagement with the spindle and capable of being clutched to the pull means, characterized in that the barrel has a lock sleeve positioned thereon, and that the spindle is provided with a stop ring carried by the spindle and axially located thereon so that at a prolongation of the adjuster the stop ring will force-transmittingly contact the lock sleeve part of the barrel with the spindle still in thread engagement in the adjuster nut.

4,418,802

SHOCK ABSORBER

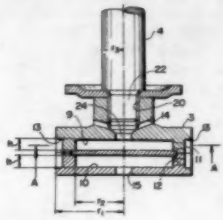
Naoto Fukushima, Fujisawa; Kazuoh Iwata, Kamakura, and Kunihiko Hidaka, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 20, 1981, Ser. No. 285,049

Claims priority, application Japan, Aug. 7, 1980, 55-108965

Int. Cl.³ F16F 9/34

U.S. Cl. 188—282 **7 Claims**



1. A hydraulic shock absorber including a piston disposed within a hollow cylinder in movable position responsive to a shock applied thereto, said piston defining a hollow vortex chamber therein, said vortex chamber being communicated with fluid chambers defined in the hollow cylinder to introduce a working fluid and to generate a vortex-type fluid flow therein for producing an absorbing force,

wherein the vortex chamber is sized to satisfy the specific relationship

$$1 \leq h \cdot Sv/So \leq 6$$

where:

h is the depth of the vortex chamber;

Sv is the cross-sectional area of the vortex chamber; and

So is the effective cross-sectional area of the piston acting on the fluid to increase or decrease the pressure thereof.

4,418,803

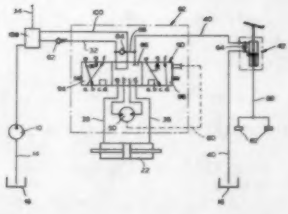
METHOD AND MEANS FOR BLEEDING HYDRAULIC BRAKES

Willard L. Chichester, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 26, 1981, Ser. No. 267,145

Int. Cl.³ B60T 11/30

U.S. Cl. 188—352 **21 Claims**



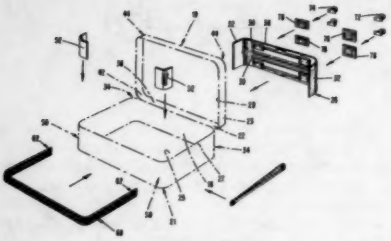
6. In a main hydraulic system for vehicles a supply pump, a control valve for controlling the operation of a hydraulic component of the vehicle adapted to operatively connect the pump to a sump by way of a fluid return conduit which connects the control valve to the sump, a hydraulic brake system operatively connected to said return conduit including a master control cylinder means and air bleed valves operatively connected to said cylinder means, and a restriction in said fluid

return conduit for generating a flow of fluid through said brake system which purges entrained air from the brake system through the bleed valves when the bleed valves are open and fluid is flowing, in said return conduit.

4,418,804
REINFORCED SOFT-SIDED LUGGAGE HAVING GROUND SUPPORT WHEELS

Leonard R. Bradley, Cumberland; Wayne I. Schmitt, Bristol, and Antone F. Macedo, Jr., Manville, all of R.I., assignors to American Tourister, Inc., Warren, R.I.

Filed Dec. 22, 1981, Ser. No. 333,562
Int. Cl.³ A45C *13/36, 13/26;* B62B *11/00;* A45C *5/14*
U.S. Cl. 190—18 A **4 Claims**



1. In a soft-sided piece of luggage comprising a container and a cover formed of a soft material; said container including a rear wall and rear corners at opposite ends thereof; said cover being hingedly connected to said rear wall and including a main portion and a skirt depending laterally therefrom; said skirt having a first peripheral edge defining a single plane, and a first zipper track extending around said first peripheral edge, said container including a second peripheral edge defining a single track; a one-piece molded plastic floor plate positioned along the inside of said rear wall and including curved ends extending around said rear corners and terminating adjacent said rear corners, said curved ends projecting beyond said peripheral edge of said container to shape respective rear corners of said skirt when said cover is closed; said one-piece floor plate including a plurality of inwardly protruding wheel wells which open outwardly in a direction away from the interior of said container; each wheel well including a base wall and side walls formed by portions of said floor plate, and a plurality of wheel assemblies mounted in respective ones of said wheel wells, each wheel assembly comprising a yoke mounted to said base wall of its respective wheel well and projecting outwardly therefrom and a wheel rotatably mounted on said yoke.

4,418,805
HINGE MEANS AND LUGGAGE COMBINED THEREWITH

Robert C. Wolff, 955 Crystal Ct., New Orleans, La. 70124

Filed Jul. 9, 1981, Ser. No. 281,591
Int. Cl.³ A45C *3/00;* E05D *1/04*
U.S. Cl. 206—279 **12 Claims**

5. In a full length garment suitcase having garment containing halves which are operably connected to each other, the improvement which comprises:

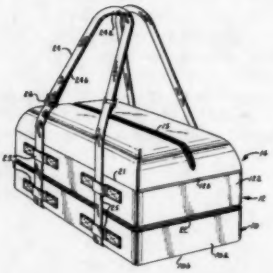
providing butt plate portion operably connected to each half by retro fit hinge means comprising stationary inner segment means rigidly affixed to said butt plate portion; intermediate wedgeshaped segment means slidably attached to said inner segment means; and outer segment means slidably attached to said intermediate wedge shaped means, rigidly affixed to an adjoining suitcase half

allowing action of said outer segment means relative to said inner segment means.

4,418,806
THREE COMPARTMENT TRAVEL BAG

Rheuben C. Johnson, 8904 Pawnee, Leawood, Kans. 66206

Filed Aug. 20, 1982, Ser. No. 409,954
Int. Cl.³ A45C *3/00, 13/00, 13/26*
U.S. Cl. 190—111 **9 Claims**



1. A travel bag for carrying clothing and the like comprising:

at least three separate sections providing separate storage compartments having generally similar sidewall outlines, the sections being stacked on one another to provide a top section, a bottom section and in intermediate section between the top and bottom sections,

the bottom and intermediate sections each having sidewalls providing upper and lower sidewall edges, the lower sidewall edges of the intermediate section registering with the upper sidewall edges of the lower section,

the intermediate section has a closed top panel bordered by its upper sidewall edges,

the bottom section has a closed bottom panel bordered by its lower sidewall edges,

displaceable partition means separating the compartment formed within the intermediate section from that formed within the bottom section when the sections are in the stacked condition,

means connecting the intermediate section to the bottom section whereby to permit swinging movement of said intermediate section from the stacked position thereon to an inverted position to one side of said bottom section thus to uncover the top of said bottom section,

means connecting the top section to the intermediate section whereby to permit swinging movement of the top section relative to the intermediate section to one side of said intermediate section which side of said intermediate section is opposite from the connection with the bottom section,

displaceable closure means for the top section permitting access to the top section compartment in either the stacked or side by side disposition of the sections, and

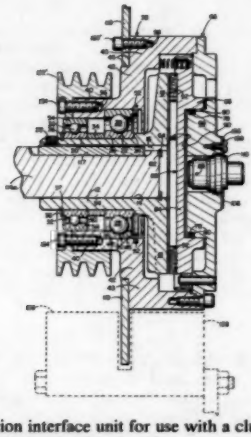
a flexible carrier strap associated with the bottom and intermediate sections and providing hand grip portions which can be gripped and positioned above the top section for lifting the bag when the sections are in the stacked condition.

4,418,807

FRICTION INTERFACE UNIT FOR A CLUTCH AND A BRAKE

Charles D. Raines, Bethel, Minn., assignor to Horton Industries, Inc., Minneapolis, Minn.

Filed May 11, 1981, Ser. No. 262,407
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—18 A **5 Claims**



1. A friction interface unit for use with a clutch, a brake or a clutch-brake, comprising:

(a) a hub adapted to receive a shaft,

(b) said hub having an annular friction flange extending radially therefrom;

(c) a first housing portion including a cylindrical hollow base portion,

(d) bearing means interposed between and in radial alignment with said hub and said hollow base portion of said first housing portion,

(e) said hollow base portion having means for mounting a sheave thereon in radial alignment with said hub and said bearing means with the unit as a clutch or a clutch-brake or for mounting on an anchor mount with the unit as a brake,

(f) said hollow base portion terminating in a radially extended annular wall,

(g) means for mounting a ring disc on said annular wall adapted for engagement of the ring by a caliper brake,

(h) a second housing portion having a central circular portion terminating at a portion of its periphery in

(i) an annular flange portion,

(j) means for securing the second housing portion to the first housing portion thereby forming a full housing for the unit,

(k) an annular piston,

(l) means mounting said piston on said circular portion to form a cylinder,

(m) a friction ring mounted on said piston opposite to and for engagement with said annular friction flange,

(n) said second housing portion having a series of spaced torque pins carried thereby and slideably mounted in said annular piston,

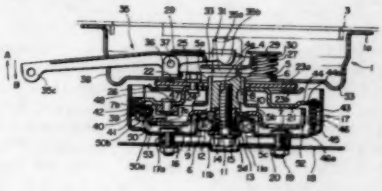
(o) said central circular portion having means mounted thereon and in communication with said cylinder for introducing fluid pressure into said cylinder to thereby activate said piston to cause said friction facing thereon to engage said annular friction flange.

4,418,808

CENTRIFUGAL CLUTCH BRAKE ARRANGEMENT FOR FARM WORK MACHINERY OR OTHER APPARATUS

Shigeo Nagai, Sanada, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Nagano, Japan

Filed May 20, 1981, Ser. No. 265,808
Claims priority, application Japan, May 21, 1980, 55-67561; May 22, 1980, 55-70691[U]; May 29, 1980, 55-71766; May 29, 1980, 55-74108[U]; May 29, 1980, 55-74109[U]
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—18 R **6 Claims**



1. A centrifugal clutch brake arrangement for farm work machinery or other apparatus comprising a member attached rotatably to an output shaft extending from a member fixed to an engine mounting, a drum fixed to said shaft for rotation therewith, a clutch plate disposed between said drum and said fixed member, a disc plate fixedly mounted on said clutch plate in face-to-face relation to said fixed member, a brake plate disposed between said disc plate and said clutch plate and engaging said disc plate, a pair of guide pieces formed on said brake plate, supportably inserted through said fixed member and terminating in a retainer, a pressure spring interposed between said fixed member and said retainer for biasing said brake plate toward said fixed member, a clutch spring interposed between said clutch plate and said first mentioned member for biasing said clutch plate toward said drum whereby the peripheral edge of said clutch plate is placed in slidable engagement with said drum in the direction of the output shaft of said rotatable member, said fixed member, drum, clutch plate, disc plate, brake plate, and shaft being coaxial, and an arcuate fly-weight pivotally mounted at one end thereof on said clutch plate such that the other end moves outwardly by centrifugal force until said fly-weight engages said drum, so that when a push is given to said brake plate against said pressure spring, said disc plate is caused to move away from said fixed member with subsequent disengagement of said brake plate out of said disc plate, thereby urging said fly-weight upon said drum.

4,418,809

COMBINATION HANDWHEEL AND HANDWHEEL CLUTCH FOR SEWING MACHINES

Boleslaw Kornatowski, Elizabeth, N.J., assignor to The Singer Company, Stamford, Conn.

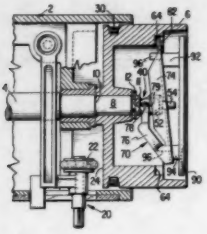
Filed Nov. 9, 1981, Ser. No. 319,828
Int. Cl.³ F16D *11/00, 13/60*; D05B *59/00*
U.S. Cl. 192—67 R **5 Claims**

1. In a sewing machine having an arm shaft, a handwheel, and a drive means for rotating said hand wheel, a clutch means for drivingly coupling said handwheel to said arm shaft comprising:

a. a drive notch formed in said handwheel and

b. a driving element supported on said arm shaft for rotation

therewith and arranged to tilt between each of two bistable positions, when in the first of said bistable positions said driving element is in driving engagement with said drive notch and when in the second of said bistable positions said driving element is not in driving engagement with said drive notch, wherein said driving element comprises an elongated portion having a centrally located



discontinuity for tiltably engaging the end of said arm shaft and a leaf spring arranged adjacent to and on one side of said discontinuity to interferingly engage said arm shaft, the arm shaft including a flat surface parallel to the axis thereof, and the driving element including a side wall which is arranged to loosely contact the arm shaft to thereby effect a rotational couple between the arm shaft and said driving element.

4,418,810

CLUTCH CONTROL SYSTEM

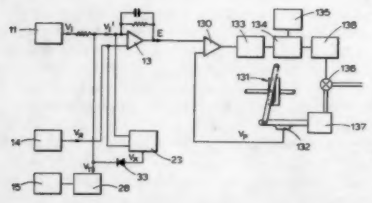
Harry M. Windsor, Harbury, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Jun. 30, 1981, Ser. No. 279,085

Claims priority, application United Kingdom, Jul. 8, 1980, 8022348

Int. Cl.³ B60K *41/02*

U.S. Cl. 192—0.076 **3 Claims**



1. A vehicle transmission clutch electronic control system comprising:

generator means producing an electrical reference signal;

sensor means for producing a signal representative of engine speed;

a throttle position sensor means which produces a throttle signal indicative of throttle opening, said throttle signal and engine speed signal being combined to form a modified engine speed signal;

comparator means arranged to receive and compare the modified engine speed and reference signals and produce a consequent error signal;

a clutch actuator that operates the vehicle clutch and a control means responsive to the error signal and which causes the actuator to vary the state of engagement of the clutch to equalise the modified engine speed signal and reference signal.

4,418,811

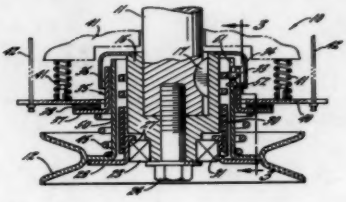
CLUTCH WITH FAIL-SAFE HELICAL SPRING

J. G. Fraser MacDonald, Detroit, Mich., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed May 4, 1981, Ser. No. 260,413

Int. Cl.³ F16D *13/08, 67/02*

U.S. Cl. 192—81 C **5 Claims**



1. A clutch comprising rotatably mounted input and output hubs, a radially contractible helical spring telescoped over said hubs and having one end turnable with said output hub, said spring having a relaxed inner diameter which is greater than the outer diameter of said input hub whereby the spring loosely surrounds the input hub when the spring is relaxed, an actuator movable axially of said hubs between a clutch-engaged position and a clutch-disengaged position, means for turning said actuator as said actuator is moved axially between said positions, the other end of said spring being connected to said actuator and turning in a direction to cause said spring to contract around and grip said input hub when said actuator turns upon being moved axially to said clutch-engaged position, and a second spring acting on said actuator and biasing said actuator axially toward said clutch-engaged position.

4,418,812

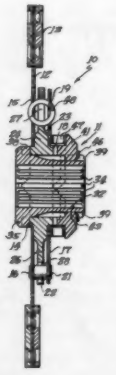
CLUTCH DRIVEN PLATE ASSEMBLY WITH A FLOATING HUB

Thaddeus Lech, Jr., Sterling Heights, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 27, 1981, Ser. No. 248,106

Int. Cl.³ F16D *3/14*

U.S. Cl. 192—106.2 **13 Claims**



1. A clutch driven plate assembly for an automotive vehicle clutch driving a transmission input shaft, comprising a multi-part hub assembly including an inner hub operatively connected to the transmission input shaft, an outer hub encompassing said inner hub and having an integral radial flange operatively connected to friction facings located between a engine

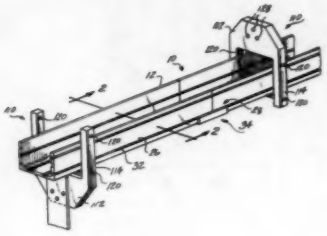
flywheel and a clutch pressure plate, said inner hub having a radial flange at one end and a stop ring adjacent the opposite end, said radial flange having a surface facing the outer hub flange, a back plate positioned on said inner hub adjacent said stop ring, a plurality of intermeshing camming surfaces formed on the flange surface and facing surface of the outer hub so that relative rotation betwen the hubs will result in axial motion of the inner hub on the transmission shaft, and resilient means between said back plate and outer hub to yieldably bias the camming surfaces into engagement.

4,418,813

MODULAR OPEN CHUTING

John T. Leisenger, Pontiac, Mich., assignor to Modular Automation, Inc., Clarkston, Mich.

Continuation-in-part of Ser. No. 265,664, May 20, 1981, Pat. No. 4,381,834. This application Oct. 19, 1981, Ser. No. 312,541
Int. Cl.³ B65G *13/11*
U.S. Cl. 193—35 J **9 Claims**



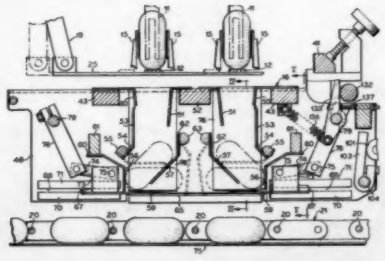
1. A modular chute with open top and bottom for passing a work piece therealong comprising:
- a pair of spaced apart sidewalls having an upper edge and a lower edge;
- a plurality of clips deployed along said upper and lower edges to secure said sidewalls in the spaced apart position; and
- means for releasably securing a wear resistant workpiece support member to said clips;
- and wherein said clips include means for snappedly securing said clips to the sidewalls.

4,418,814

FINGER COOKIE ORIENTING APPARATUS

Edward Rose, Skokie, Ill., assignor to Peters Machinery Company, Subsidiary of Katy Industries, Inc., Chicago, Ill.

Filed Feb. 20, 1981, Ser. No. 236,636
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—406 **12 Claims**



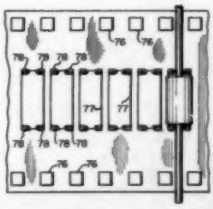
1. In an apparatus for conveying and orienting elongated finger cookies or other bakery products in groups for packaging, at least one drop gate, conveying means for conveying counted groups of cookies along said drop gate with their longest dimensions extending vertically, a drop chute assembly extending beneath and in cookie receiving relation with respect to said drop gate, a retractible support plate in cookie receiving relation with respect to said drop gate, means moving said drop gate out of supporting engagement with a group of cookies to accommodate dropping of the group of cookies along said drop chute assembly, a cookie orienting extension at the lower end of said drop chute assembly for turning each counted group of cookies from an upright position to a flat position on said retractible support plate, said cookie orienting extension including a retractible orienting wall extending along one side of said drop chute assembly and angularly downwardly relative thereto, a stop wall at the opposite side of said drop chute assembly from said cookie orienting wall, and means for pivotally moving said cookie orienting wall out of supporting engagement with the cookies engaging said stop wall to accommodate the cookies on the cookie orienting wall and engaging said stop wall to be lowered onto said retractible plate upon movement of said cookie orienting wall in a direction away from said drop chute assembly to a position 90 degrees from their positions on said drop gate as said cookie orienting wall pivotally moves outwardly of said drop chute assembly.

4,418,815

NONMAGNETIC LEAD HANDLING SYSTEM

Gary W. Anderson, Transfer, and Dennis G. Stake, Greensville, both of Pa., assignors to Electronic Equipment Development Ltd., Toluca Lake, Calif.

Filed Aug. 7, 1981, Ser. No. 291,028
Int. Cl.³ B65G *47/84*
U.S. Cl. 198—476 **14 Claims**



1. A tape for receiving axial lead components comprising an elongate strip of flexible metal tape successively die punched to provide a plurality of sprocket receiving holes along each edge, a plurality of component receiving holes spaced along the center line of the tape, bounded by spaced pairs of tabs rising from a base only at each lateral end of the component receiving holes, each opposed end pair of tabs defining therebetween an open slot extending to the base of the tabs, said slot being narrower at the top than at the base.

4,418,816

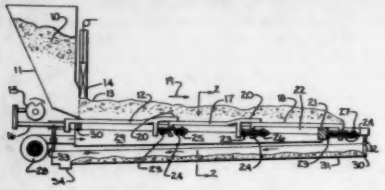
INERTIAL CONVEYOR

Lev Kropp, 2178 W. Marne Ave., Milwaukee, Wis. 53209

Filed Oct. 19, 1981, Ser. No. 312,399
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—773 **4 Claims**

1. An inertial conveyor having an immovable rest, a plurality of consecutive conveying surface sections slidably mounted on parallel rails for lateral movement toward said rest, the rear end of each of said sections covering the front end of the next section and the rear end of the last section covering the front end of the immovable rest, a plurality of springs operatively connected to said sections, said springs permitting said sections to shift back and forth towards each other and the immovable rest, and drive means for delivering lateral driving impulses to

the sections thus forcing any material on the conveying surfaces of said sections to move by inertia towards the immovable rest, said drive means being operatively connected to only



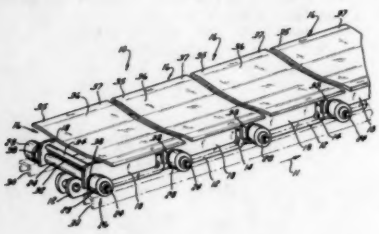
the first section and each of said sections other than the first section receiving lateral driving impulses from the previous section through said springs.

4,418,817

CONVEYOR CHAIN HAVING CARRIER ROLLERS

Donald E. Martin, Waukesha, and Victor D. Petershack, Elm Grove, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Jul. 17, 1981, Ser. No. 284,263
Int. Cl.³ B65G *39/20*
U.S. Cl. 198—845 **11 Claims**



1. A conveyor chain, comprising:
a plurality of chain links;
a plurality of pins interconnecting said chain links;
a plurality of cart carriers mounted on top of said chain links, each cart carrier comprising:
a. a pair of frame members defining a pair of apertures toward one end;
b. an axle extending between said frame members and through said apertures;
c. a pair of carrier rollers rotatably mounted on said axle;
d. a top plate support bar extending between said pair of frame members above said axle and attached at each end to one of said frame members; and
e. a top plate lying on top of and attached to said pair of frame members, the front end of said top plate extending beyond said frame members so as to be supported by the top plate support bar of the preceding cart carrier.

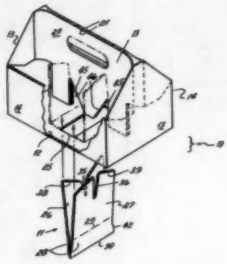
4,418,818

BASKET CARRIER FOR BOTTLES HAVING TRANSVERSE DIVIDERS INSERTED THROUGH THE BOTTOM WALL

Orison W. Stone, Middlebury, Vt., assignor to Pack Image, Inc., Middlebury, Vt.

Filed Aug. 23, 1982, Ser. No. 410,824
Int. Cl.³ C23F *13/00*
U.S. Cl. 206—196 **8 Claims**

1. In a basket carrier for bottles and having a bottom wall, opposed end walls, opposed side walls and a central longitudinal divider, the improvement comprising a transverse divider structure comprising,
a transverse slot formed across a major portion of said bottom wall,
two inverted V-shaped slots in the lower portion of said central divider,
a transverse divider element, said divider element being U-shaped and having vertical divider walls containing V-shaped slots which engage the central divider V-shaped slots to hold said divider walls in a vertical attitude,



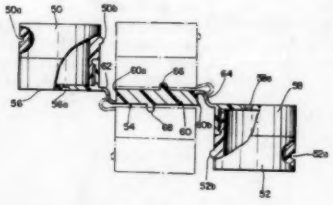
said transverse divider having a horizontal wall whose longitudinal dimension is substantially greater than the width of the slot in said bottom wall,
said horizontal wall being transversely creased to permit the divider to be folded into a V for insertion into said carrier through said slot,
after said transverse divider is inserted in said carrier, said horizontal wall spreads beyond said slot and a substantial portion of it overlies said bottom wall where it is retained by the weight of bottles on it.

4,418,819

DUAL CONTAINER APPARATUS

Richard N. Shapiro, 512 N. Oakland St., Arlington, Va. 22203

Filed Sep. 30, 1982, Ser. No. 431,056
Int. Cl.³ B65D *77/00*
U.S. Cl. 206—216 **10 Claims**



1. A container apparatus for separately housing at least two materials, said apparatus comprising:
a first container having an opening in one end thereof;
a second container having an opening in one end thereof;
a first cover for said opening of said first container;
a second cover for said opening of said second container;
a further cover means which is adapted to be selectively and detachably connected to each of said first and second covers so as to form an integral unit with said covers when connected thereto; and
means for hingedly connecting said first and second covers to said further cover means;
said covers and said further cover means including projection and socket means for detachably connecting said

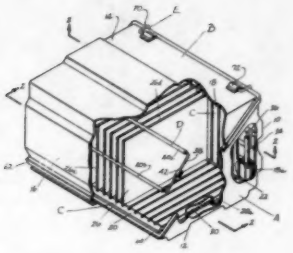
further cover means to said covers such that when said covers are so connected to said cover means said containers are supported in stacked relationship to one another.

4,418,820

CIRCUIT BOARD CASE

Joseph J. Nagle, 165 Ten Rod Rd., Rochester, N.H. 03867, and Joseph Vitko, Jr., 32 Lexington St., Dover, N.H. 03820

Filed Oct. 23, 1981, Ser. No. 314,182
Int. Cl.³ B65D *73/02*; H02B *1/04*
U.S. Cl. 206—334 **11 Claims**



1. A carrying case for printed circuit boards and the like comprising:

a case;

a cover forming a closed container when fitted together with said case;

interchangeable insert means carried in an interior of said case including groove means receiving and supporting side edges of two intersecting sides of said boards;

fastening means securing said insert means in said case;

a clamp assembly carried by said case engaging remaining sides of said boards clamping same tightly in said case;

attachment means interconnecting said case and cover;

said case and cover having a configuration permitting nesting of said case within said cover;

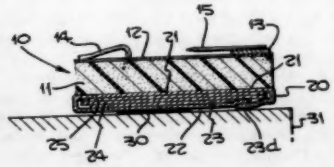
closure means carried by said cover having a first operable position securing said case and cover together in said container configuration and a second operable position providing a base support for said case and cover in said nester configuration supporting same on a table surface and the like in a working position.

4,418,821

DISPOSABLE SURGICAL INSTRUMENT PLATFORM AND CONTAINER

Dan S. Sandel, 19524 Halsted St., Northridge, Calif. 91324

Filed Dec. 31, 1981, Ser. No. 336,034
Int. Cl.³ B65D *83/10*
U.S. Cl. 206—370 **16 Claims**



1. A disposable surgical instrument platform and container comprising:

an individual platform for receiving surgical instruments thereon and

a folded container means for providing a supporting base for said platform while said platform receives surgical instruments thereon and for providing an enveloping container for said platform and surgical instruments for disposal thereof by being folded up about said platform, said container means comprising a one piece sheet of foldable panels including a center panel, a pair of side panels and a pair of end panels, all foldable into a first position of use wherein all of said panels are in a vertically aligned, stacked relation directly under and supporting said platform and being foldable into a second position of use wherein said center panel underlies said platform, said pair of side panels are foldable up about sides of said platform and said pair of end panels are foldable up about ends of said platform with said panels providing panel portions overlying and covering said platform upper surface.

4,418,822

SEALED PACKAGE FOR WOUND DRESSING ADHESIVE TAPE

Angelo Dotta, Via Altabella 10, Bologna, Italy

Filed Jun. 3, 1982, Ser. No. 384,531
Claims priority, application Italy, Jun. 11, 1981, 67812 A/81
Int. Cl.³ A61F *13/02*
U.S. Cl. 206—441 **4 Claims**

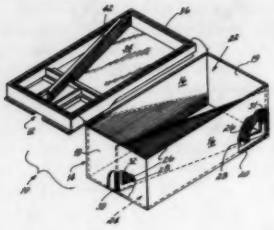
1. A rapidly opening sealed package for wound dressing adhesive tape, comprising an adhesive support having a non-adhesive wound dressing area carrying a wound dressing pad, a pair of protective films attached to said adhesive support, and an outer wrapper formed substantially of a pair of flat tubular outer sheaths closed at their peripheral edges and having adjacent ends adhesively sealingly connected to one another but separable by pulling them apart, characterized in that said pair of protective films have a small degree of adhesion only at their inner surfaces attached to said adhesive support and each of them is adhesively connected to a separable portion of said wrapper by means of an adhesive layer provided between a portion of an outer surface of each protective film and a corresponding adjacent portion of an inner surface of said wrapper in an area in the vicinity of said wound dressing pad, the overall assembly being of a generally flat configuration and such that when pulling apart said tubular sheaths of said wrapper said protective sheaths will remain adherent in the portion thereof adhesively connected to the corresponding separated portions of said wrapper and will be folded back upon themselves in opposed S and Z shapes and will be detached from said wound dressing pad by sliding within said wrapper formed of said pair of tubular sheaths, exposing said wound dressing pad ready for application.

4,418,823

MEDICATION HANDLING SYSTEM AND REUSABLE DISPENSING CONTAINER

Jerome M. Romick, 5191 Etna Rd., Columbus, Ohio 43213

Filed Mar. 4, 1981, Ser. No. 240,266
Int. Cl.[3] B65D *69/00, 83/00*
U.S. Cl. 206—538 3 Claims



1. A reusable medication dispenser comprising a bottom part, said bottom part having a plurality of walls including sidewalls, a bottom wall and end walls,

a divider wall extending between said end walls dividing said dispenser into two chambers, one of said chambers comprising a large chamber and the other a reserve chamber, said divider wall being positioned so that the large chamber is larger than the reserve chamber, said reserve chamber providing a chamber for a reserve supply of medication, said divider wall being nonparallel to the side walls and readily removable from the dispenser to permit clearing, and said divider wall being approximately as high as said side walls,

a removable closure top which can cover said bottom part, said closure top having top and bottom surfaces, said upper surface having openings one of which overlies the reserve chamber and the other overlies the large chamber permitting medication contained in the large chamber to be dispensed until depleted and then dispensed from the reserve chamber, each opening being provided with a hinged flap, said bottom surface having a circumferential channel adapted to receive the side walls and end walls of said top part whereby said closure top is held securely in place.

4,418,824

DUAL STACKER FOR SLOT ACCEPTOR

Robert L. Gorgone, Mentor, and Anthony H. Dolejs, Bedford Heights, both of Ohio, assignors to Ardac, Inc., Eastlake, Ohio

Filed Jul. 8, 1981, Ser. No. 281,326
Int. Cl.[3] B07C *5/36;* B65H *31/06*
U.S. Cl. 209—534 10 Claims

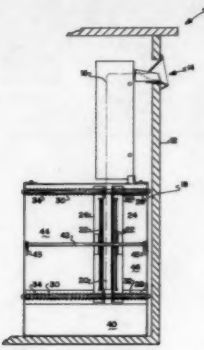
1. Apparatus for receiving and storing notes of different denominations in a note acceptor, comprising:

a receptacle for temporarily receiving a note;

a punch reciprocatingly removable through said receptacle;

receiving means on either side of said receptacle, one for each denomination of note to be stored, for receiving notes moved by said punch from said receptacle; and

position sensing means operatively connected to said punch for monitoring the positional relationship of said punch with respect to said receptacle, said position sensing means comprising photodetectors interconnected with said punch, said photodetectors sensing predetermined positions of said punch, and a pair of disks interposed



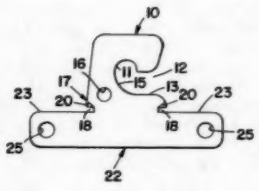
between said photodetectors, said disks having openings therein in communication with said detectors.

4,418,825

DEVICE FOR HOLDING SOFT-COVERED BOOKS

John E. Mahowald, 1401 Klepper Ave., Kingsburg, Calif. 93631

Filed Nov. 5, 1981, Ser. No. 318,325
Int. Cl.[3] A47B *65/00*
U.S. Cl. 211—42 5 Claims



1. A device to suspend a soft-cover book having a stiff spine from a rod comprising:

A. a hook element having an interior rounded opening with a radius larger than the radius of said rod, having a side opening from said interior opening through a side of said hook element, said side opening being large enough to admit said rod, with said hook element being narrower at the top than at the base thereof;

B. a locking element adjacent the base of the hook element, said locking element having an upper portion at least as wide as the base of said hook element and having a lower recess adapted to embrace the spine of said book;

C. a supporting element adjacent said locking element, said supporting element being wider than said locking element, extending laterally from both sides of said locking element, and having an upper edge that is perpendicular to the vertical axis of said hook element;

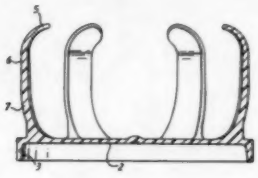
D. all of said elements being thinner than about 0.05 inches and lying substantially in the same plane; and

E. an ear adjacent said recess portion bent out from the plane in which all of the elements lie.

4,418,826
CONTAINER SPACE FILLER

Gerardo Mancini; Richard J. Searle, both of London, and Eugene E. Davis, Ilford, all of England, assignors to Johnsen & Jorgensen Limited, London, England

Filed Apr. 6, 1982, Ser. No. 365,900
Claims priority, application United Kingdom, Apr. 7, 1981, 8110814; Jun. 9, 1981, 8117549
Int. Cl.³ B65D *25/10*
U.S. Cl. 215—231 4 Claims

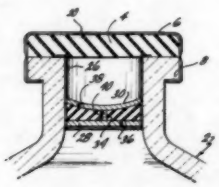


1. A space filler designed to be disposed within a space in a filled container between the top of the contents of the container, the inner surface of the closure cap for the container and the inside side surface of the container to minimize unwanted movement of the contents of the container, said space filler comprising a base member adapted to rest on said top of the contents of the container and a plurality of resilient spacer arms projecting upwardly from said base member so that when in use at least some of said spacer arms are compressed and deformed and make contact with said inner surface of the closure cap and with said inside side surface of the container, said spacer arms are disposed adjacent to the periphery of said base member and are curved inwardly towards the centre thereof so that in operation on compression of the spacer arms during closure of said container the arms bow outwardly to press against said inside side surface of the container as well as being pressed downwardly by said inner surface of the closure cap.

4,418,827
TAMPER-ALERTING DEVICE FOR VIALS AND SYRINGES

Ida M. Butterfield, Santa Maria, Calif., assignor to Butterfield Group, Santa Maria, Calif.

Filed Mar. 31, 1982, Ser. No. 363,906
Int. Cl.³ B65D *41/20*
U.S. Cl. 215—247 7 Claims



1. In a container of the type having a mouth sealed by a diaphragm that in normal use is penetrated by a hypodermic needle to permit the fluid contents of the container to be removed, the improvement comprising:

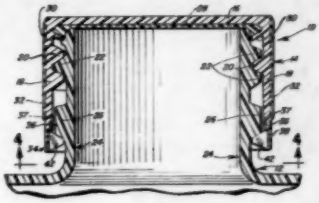
an insert mounted in the mouth of the container and defining a central opening; and,

an object retained by a friction fit within the central opening of said insert in a position immediately adjacent the inwardly-facing surface of the diaphragm, so that said object will be dislodged from said insert by a hypodermic needle inserted through the diaphragm.

4,418,828
PLASTIC CLOSURE WITH MECHANICAL PILFER BAND

Sheldon L. Wilde, and Thomas J. McCandless, both of Crawfordsville, Ind., assignors to H-C Industries, Inc., Crawfordsville, Ind.

Filed Jul. 24, 1981, Ser. No. 286,375
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 57 Claims



1. A closure for a container having a threaded neck including an annular locking ring portion comprising:

a cap having a top wall portion, and a cylindrical threaded skirt portion depending from said top wall portion, and

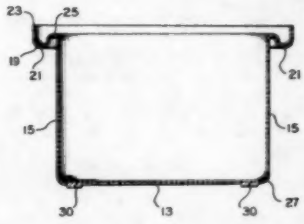
pilfer band means depending from said skirt portion and distinguished therefrom by a fracturable area,

said pilfer band means including an annular band portion and a plurality of wing means each extending integrally inwardly of said band portion, and each being adapted to flex generally about an axis disposed at an acute angle to the axis of said cap during application of said closure to said container, whereby after said closure is applied to said container, said wing means are adapted to engage a lower surface of said locking ring portion when said closure is rotated for removal from said container thereby fracturing said fracturable area.

4,418,829
WASHING AND RINSING VESSEL WITH DEBRIS CATCHING CHANNEL

Irene Clay, Rte. 2, Box 481, South Boston, Va. 24592

Filed Nov. 16, 1981, Ser. No. 322,054
Int. Cl.³ B65D *1/34, 1/46, 43/06;* B08B *9/08*
U.S. Cl. 220—74 1 Claim



1. A vessel for washing and rinsing produce which leaves the produce virtually free of debris, said vessel comprising:

a bottom wall and side walls surrounding said bottom wall and extending upward from said bottom wall, said bottom wall and side walls defining a cavity adapted to contain said produce and to have a washing liquid introduced therein, said side walls having an outwardly extending flange about the entire periphery of said vessel at the upper extremity of said side walls, said flange being joined to channel depending immediately from the outermost

edge of said flange and extending about the entire periphery of said vessel, said channel having a plurality of drain holes in the bottom of said channel, said channel terminating in an outer peripheral wall having an upper terminal edge higher than said flange, and said outer peripheral wall being joined to said side walls so that washing liquid and debris unrestrictedly overflow said outwardly extending flange of said side walls into said channel while restricted in movement therefrom by said outer wall, and said washing liquid in said channel is being constantly drained through said drain holes in said channel and while said debris is retained in said channel.

4,418,830

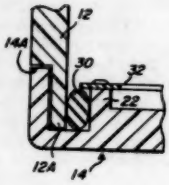
MOISTURE AND DUST SEAL ARRANGEMENT FOR A PORTABLE RADIO OR THE LIKE

John C. Dzung, Sunrise; Harry J. Perkey, Tamarac, and George J. Schmitz, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1981, Ser. No. 296,718

Int. Cl.³ B65D *53/02, 43/06*

U.S. Cl. 220—81 R **4 Claims**



1. An improved moisture and dust seal arrangement for an apparatus having a molded plastic enclosure formed by first and second mating members, including in combination:

an inturned lip and an inwardly spaced upstanding vertical wall included on one of the enclosure members in the form of a closed loop configuration and spaced from the outer edge of said one enclosure member, a plurality of right angle corners and a plurality of stake posts positioned about said closed loop vertical wall;

an O-ring positioned about the upstanding vertical wall and retained thereon by the elasticity of the O-ring; and

a flat ribbon-like member in the form of a closed loop overlying said vertical wall and cooperating with said stake posts to comprise an assembly wherein a portion extends outwardly a predetermined distance from the edge of said wall in a manner to form a groove-like space to retain said O-ring; and

said other enclosure member having an outer edge lip portion received in said space between said inturned lip of said one enclosure member and said O-ring positioned about said upstanding vertical wall to compress said O-ring in a lateral direction and form an effective moisture and dust seal.

4,418,831

CONTAINER CLOSURE AND A FRANGIBLE INNER CLOSURE

Walter Schellenberg, Unterdorf 624, Diepoldsau, Switzerland

Division of Ser. No. 143,463, Apr. 24, 1980, Pat. No. 4,365,457.

This application Jul. 19, 1982, Ser. No. 399,828

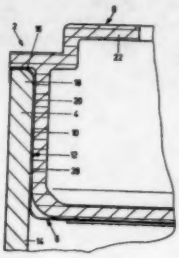
Claims priority, application Switzerland, Jun. 18, 1979, 5674/79

Int. Cl.³ B65D *51/22*

U.S. Cl. 220—258 **4 Claims**

1. An improved container closure comprising a lid at least partially insertable into an end of a container and a metal foil seal of the type including a cylindrical portion adhered to the inner surface of the container, a diaphragm portion recessed inwardly from the container end and extending across the container interior, and a tear-open tab affixed to the diaphragm, the improvement wherein

said foil seal includes means defining a groove-like circumferential region in said cylindrical portion between said



diaphragm and the end of said container separating said cylindrical portion into a removable section and a permanent section whereby, when said tab is pulled to rupture and remove said diaphragm and open the container, said seal separates along said region to facilitate removal only of the seal portion inward of said region.

4,418,832

CONTAINER WHICH CAN BE OPENED WITH ONE HAND

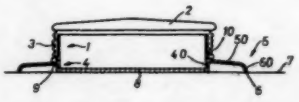
Helmut Schneider, Baar, Switzerland, assignor to Inkares AG, Zug, Switzerland

Filed Jun. 4, 1982, Ser. No. 385,213

Claims priority, application Switzerland, Jun. 25, 1981, 4209/81

Int. Cl.³ B65D *17/50, 41/02*

U.S. Cl. 220—260 **18 Claims**



18. A container comprising a receptacle portion for containing a product to be dispensed; a cover disposed on top of said receptacle portion for covering the contents disposed in said receptacle portion; said cover being secured to said receptacle portion in such a manner as to require movement in a direction away from said receptacle portion for purposes of removing said cover from said receptacle portion; finger support means secured to and disposed about at least a portion of the periphery of said receptacle portion and located adjacent said cover in the normal position of container assembly so as to provide a finger-supporting base whereby the cover may be moved away from the receptacle portion by the fingers of one hand for purposes of removing said cover from said receptacle portion.

4,418,833

LARGE VOLUME CONTAINER WITH GASKETLESS SEAL

H. Richard Landis, Oak Lawn, Ill., assignor to Landis Plastics Inc., Chicago Ridge, Ill.

Filed Dec. 14, 1981, Ser. No. 330,194

Int. Cl.³ B65D *41/16, 41/18*

U.S. Cl. 220—306 **2 Claims**

1. A plastic molded container and closure assembly for holding large volume contents comprising:

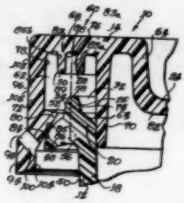
a container having an encircling container wall, an annular rim on an upper open end of said container wall;

a one-piece closure molded of resilient flexible plastic material having a top wall for covering the open end of the container wall;

an interlocking flexible bead on said closure and a rigid bead on said container for interlocking engagement with each other to secure the closure onto the container;

an annular sealing bead on said rim projecting upwardly;

inner and outer sealing flanges on said closure depending from the underside of said closure, said sealing flanges being spaced apart a predetermined distance to receive



and to abut said sealing bead when said closure is secured onto said container;

said sealing bead being tapered in an upward direction to a rounded free end, said sealing bead being centered between said sealing flanges and having a width greater than said predetermined distance for being abutted by said flanges and for spreading said flanges in a radial direction;

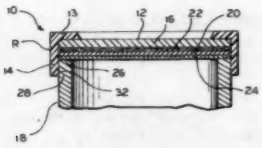
said inner and outer sealing flanges being depending rings integral with a top rim portion of said closure and being substantially longer in their downward direction than in their cross-section thickness for easy deflection by the sealing bead and for deflection by internal or external pressure to more tightly abut a side of said sealing bead.

4,418,834

OVERCAP RING WITH AN INTEGRAL PEELABLE LAMINATED STRUCTURE

Charles R. Helms, Malvern, and Richard L. Bell, Exton, both of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Sep. 13, 1982, Ser. No. 416,948
Int. Cl.³ B65D *41/00*
U.S. Cl. 220—359 **15 Claims**



1. The closure assembly for a container comprising:

a container body having an upper, open marginal portion;

an overcap ring adapted for engagement with said container body and including a generally planar portion and a downwardly depending flange portion;

a laminated structure consisting of

(a) a paperboard substrate having an undersurface,

(b) an electrically conductive layer having first and second surfaces,

(c) a first coating layer having first and second surfaces, the first surface thereof being bonded to the first surface of said conductive layer, and the second surface thereof being bonded to the undersurface of said paperboard substrate, and

(d) a second coating layer having first and second surfaces, the first surface thereof being bonded to said second surface of said conductive layer;

said overcap ring being injection molded to said laminated structure to provide an integral peelable laminated structure; and

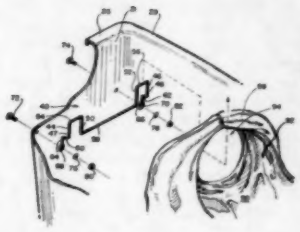
interlocking engagement means disposed on said overcap ring and said container body for maintaining said overcap ring and container body in sealing engagement.

4,418,835

TRASH CONTAINER APPARATUS

Abner W. Watts, 7231 W. Bayaud Pl., Lakewood, Colo. 80226

Filed Oct. 18, 1982, Ser. No. 437,850
Int. Cl.³ B65D *90/04*
U.S. Cl. 220—404 **2 Claims**



1. An improved trash container apparatus comprising:

(a) outer container means for structurally supporting and enclosing other container elements positioned therein, said outer container means comprising a generally rectangular bottom wall, positioned substantially in a horizontal plane, first, second, third and fourth generally trapezoidal side walls integrally formed therewith, said first wall being opposite said third wall, said second wall being opposite said fourth wall, said sidewalls having intersecting upper edge surfaces positioned substantially in a plane parallel to said bottom wall, said four intersecting upper edge surface forming a substantially rectangular figure having an area greater than said bottom wall defining a planar mouth of said outer container means, said walls and said planar mouth defining an outer container means cavity;

(b) flexible plastic inner container means operably positioned within said outer container means cavity for receiving material to be disposed of therein, said flexible plastic inner container means being formed from a flexible extensible plastic film material constructed and arranged to form a deformable enclosing envelope having an envelope cavity, said envelope comprising insertion opening means therein for inserting material to be disposed of into said enclosing envelope cavity and comprising handle opening means therein for removably mounting said flexible plastic inner container means on bracket means;

(c) first bracket means for removably supporting said flexible plastic inner container means within said outer container means cavity, comprising a single length of elongate cylindrical material having two spaced apart outer vertical portions, the lower end of each said outer vertical portion being integrally formed with a first end of an associated, transversely extending, spacer portion so that each said lower end is spaced from said outer container means; each spacer portion being integrally formed at a second end thereof with an associated downwardly extending attachment portion, each said attachment portion extending downwardly in abutting contact along the length thereof with said first wall of said outer container means, each said

attachment portion having a circular configuration at a lower end thereof; each said outer vertical portion being integrally connected at the upper end thereof with a first end of an ear horizontally extending portion; each ear horizontally extending portion extending inwardly of an associated connected outer vertical portion in a direction substantially perpendicular said spacer portions; each said ear horizontally extending portion having a second end integrally connected to an upper end of an associated inner vertical portion; each inner vertical portion having a lower end integrally connected to opposite ends of an inner horizontally extending portion extending horizontally between said inner vertical portions in parallel relationship with said ear horizontal portions; said ear horizontally extending portions being of equal relatively small lengths and said inner horizontally extending portion being of a relatively large length; said outer vertical portions being spaced apart a sufficient distance whereby tension is produced in said flexible plastic inner container means about a handle opening when said handle opening is positioned in encompassing relationship about said outside vertical portions, said inner container means being vertically supported by said spacer portions, said spacer portions providing sufficient space between said first wall and said outer vertical portions for permitting grasping of a portion of said inner container stretched between said outer vertical portions, said inner horizontally extending portion being positioned at least as low as said spacer portion whereby said inner horizontally extending portion does not interfere with removal of said inner container portion;

(d) second bracket means having an identical size and configuration as said first bracket means attached to said third wall in mirror image relationship with said first bracket means;

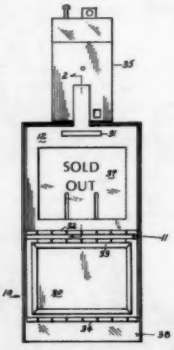
(e) connector bolts for boltingly attaching said first and second bracket means to said outer container.

4,418,836

VENDING MACHINE FOR NEWSPAPER, MAGAZINES AND THE LIKE

Donald K. Christian, 119 Woodbine Ter., Spartanburg, S.C. 29301

Filed Jul. 23, 1981, Ser. No. 286,336
Int. Cl.³ G07F *11/14*
U.S. Cl. 221—37 **4 Claims**



1. A vending machine to dispense single copies of a newspaper, magazine or the like comprising:

(a) a cabinet, said cabinet having a storage area associated therewith;

(b) a coin mechanism assembly mounted thereon, said mechanism having a coin receiving means therein and a release means to permit purchaser access to a chamber wherein is contained a single copy thereof;

(c) a hinged purchaser access door;

(d) a separation device associated with the storage area, operatively associated with said door in such manner that opening of said door will effect the separation of a single copy by inserting a portion of said seperation device generally between the topmost and secondmost copy thereinunder; said separation device moving from the back generally toward the purchaser;

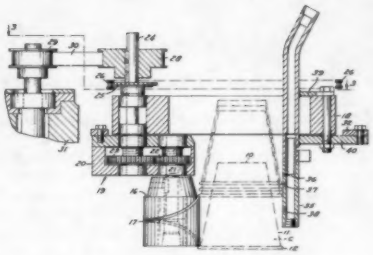
(e) an elevator so oriented as to continue presenting copies of the publication to said separation device.

4,418,837

AUTOMATIC CUP DISPENSING APPARATUS

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 6, 1981, Ser. No. 280,046
Int. Cl.³ B65H *3/28, 5/22;* B65G *59/06*
U.S. Cl. 221—222 **4 Claims**



4. An automatic cup dispenser for dispensing cups at high speeds and at predetermined intervals from a stack of cups wherein each cup includes a bottom wall, a side wall and a substantially circular peripheral top rim comprising

means for guiding a stack of inverted cups downwardly,

a frame about said stack,

a plurality of pairs of cylindrical rotors each having an annular shoulder and a helical groove extending from said shoulder for engaging the lip of the lowermost cup in a stack,

the helical groove of adjacent rotors extending oppositely,

the length of each said groove being such that upon rotation of the rotors in unison, the lip of the lowermost cup is engaged and moved downwardly out of the stack while the remainder of the cups in the stack are held by the rotor shoulders,

means for supporting said rotors on said frame in positions such that the upper end of each said rotor engages the lip of the lowermost cup in the stack, said support means comprising

a gear case for each rotor and including

a shaft, mounting the rotor for rotation thereby,

a first gear connected on said shaft,

an input shaft,

a second gear in mesh with the first gear and connected on said input shaft,

each said input shaft being rotatably mounted in said frame,

a sprocket connected on said input shaft externally of the gear case,

a chain drive member including chain idlers arranged and connected for said chain to engage the sprockets and drive all of them, but alternately in opposite directions of rotation, and

a drive motor,

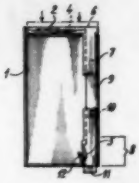
one of said input shafts being driveably connected to said motor.

4,418,838

SINGLE TABLET DISPENSING BOX

Ferenc Gallina, Bötzingen, Fed. Rep. of Germany, assignor to Van Leer Verpackungen GmbH, Hamburg, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,052
Int. Cl.³ B65H *3/00*
U.S. Cl. 221—246 **5 Claims**



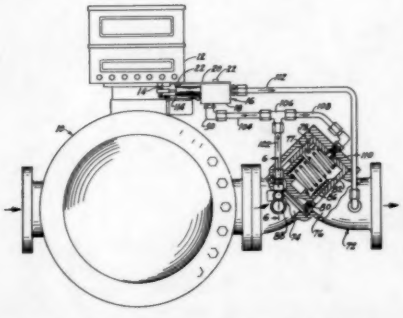
1. A single tablet dispensing box for tablets comprising a flat box-shaped container having side walls, a bottom and a cover and defining a storage space for tablets, an L-shaped sliding element movable against spring pressure along a rectilinear path defined by guiding walls in the container, wherein the short leg of the L-shaped sliding element forms a press surface for operating the element through an opening in a side wall of the container, and wherein the long leg of the L-shaped sliding element extends perpendicular to a flat, main wall of the container and has at its outer end a slanting surface controlling an outlet opening of the container, the space between said leg and said wall forming a collecting trough which is slightly larger than the thickness of a tablet so as to form a row of tablets on said leg, said container and said long leg having cooperating means adjacent the slanting surface which upon movement of the element narrows the space above the slanting surface to a dimension smaller than the dimension of a tablet.

4,418,839

METER CONTROLLED DISPENSING APPARATUS

Jimmy B. Nichols, Statesboro Township, Bulloch County, Ga., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 29, 1981, Ser. No. 278,891
Int. Cl.³ B67D *5/30*
U.S. Cl. 222—14 **5 Claims**



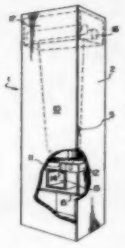
1. In apparatus for dispensing a predetermined quantity of liquid wherein a hydraulically operated main valve has a valve body and a valve element therein which is biased closed when inlet pressure is applied equally to both sides thereof and is moved openward by inlet pressure as the inlet pressure on its downstream side is progressively exhausted downstream of the valve element through a pilot valve operatively connected to a meter actuated preset mechanism; the improvement which consists in providing a pilot valve having a body spaced from said main valve and rigidly mounted on a casing enclosing said meter actuated preset mechanism, said pilot body having an inlet and an outlet and a single valve element therein operatively connected to said preset mechanism and movable thereby to three discriminate positions i.e., a first closed position in said pilot body in which no inlet pressure applied to the outlet side of said main valve element is exhausted therethrough, a second open position in which sufficient inlet pressure being applied to the outlet side of said main valve element is exhausted therethrough to effect full opening of said main valve element, and a third partially open position in which just sufficient inlet pressure is exhausted therethrough to effect a partial opening of said main valve element, and in connecting the pilot valve body to the body of said main valve body by detachably connected conduits thereby to provide communication between said main and pilot valves.

4,418,840

AUTOMATIC TOOTHPASTE DISPENSER

David P. Gardner, Sr., Box 1927, Parksville, B.C., Canada V0R 2S0

Filed Feb. 23, 1981, Ser. No. 236,851
Int. Cl.³ B65D *35/28*; B65G *27/18*
U.S. Cl. 222—96 **8 Claims**



1. A dispenser for automatically dispensing semi-fluid material from a compressible tube having an outlet in the form of an opening, comprising:

(a) means for holding the tube with the outlet directed downwardly so that gravity urges the contents to move toward the outlet;

(b) a slidable closure for the opening in the tube;

(c) agitating means for agitating the tube and semi-fluid contents to induce the contents to flow from the tube outlet when the outlet is open;

(d) means operable when actuated for withdrawing the slidable closure from the opening and to initiate operation of said agitating means to agitate the tube and contents and thereby effect flow of the contents from the tube;

(e) the tube holding means (a) comprising a pair of parallel rollers which between them hold the end of the tube opposite end and upon agitation are caused to roll under the influence of gravity down either side of the tube to aid in dispensing the semi-fluid contents of the tube; and

(f) an opening receiving collar which holds therein the open end of the tube.

4,418,841

MULTIPLE LAYER FLEXIBLE SHEET STRUCTURE

John P. Eckstein, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Sep. 29, 1981, Ser. No. 306,675
Int. Cl.³ B65D *35/08*; B32B *15/08, 27/08*
U.S. Cl. 222—107 **33 Claims**

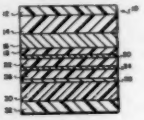
1. A multiple layer sheet structure wherein the layers are firmly adhered to each other to make a unitary sheet structure

having two exterior surface layers and a plurality of interior layers, the layers comprising, in order:

(a) a heat sealable polymeric layer on a first one of said exterior surfaces of said structure;
(b) a first adhesive layer;
(c) layer of metal foil 0.35 to 2.0 mils thick;
(d) a second adhesive layer;
(e) an OPP layer at least 0.65 mil thick; and
(f) a polyethylene layer;

said second adhesive layer and said polyethylene layer, acting in an adhesive capacity, being effective collectively, to join said OPP layer into the structure with adhesion of at least 54 grams per inch width at each interface with said OPP layer.

20. A flexible dispensing tube made of multiple layer sheet material wherein the layers are firmly adhered to each other to



make a unitary sheet structure having two exterior surface layers and a plurality of interior layers, said sheet structure comprising consecutive layers of, in order:

(a) a first heat sealable polymer layer on a first exterior surface of the structure;
(b) a first adhesive layer,
(c) a metal foil layer 0.35 to 2.0 mils thick;
(d) a second adhesive layer;
(e) an OPP layer at least 0.65 mil thick;
(f) a third adhesive layer;
(g) a paper layer; and
(h) a second heat sealable polymer layer on the second exterior surface of the structure, said second and third adhesive layers being effective collectively to join said OPP layer into the structure with adhesion of at least 54 grams per inch at each interface with said OPP layer.

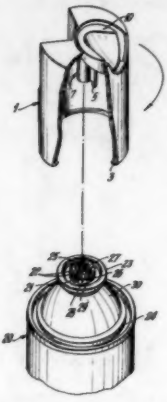
4,418,842

CHILD RESISTANT CLOSURE

Joseph Di Loreto, Yonkers, N.Y., assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed Mar. 31, 1981, Ser. No. 249,630
Int. Cl.³ B65D *83/14;* B67D *5/32*
U.S. Cl. 222—153 **5 Claims**

1. A child resistant closure for a pressurized aerosol dispenser comprising an actuator cap rotatable with respect to the dispenser container and a collar affixed to the container, the collar having a plurality of circumferentially arranged detents, a blank space having no detents, a shoulder, and a vertical slot associated with a predetermined detent and extending through the shoulder, said cap having a flexible blade arranged to cooperate with the collar detents to produce clicks as the collar is rotated, said cap having means to abut the shoulder



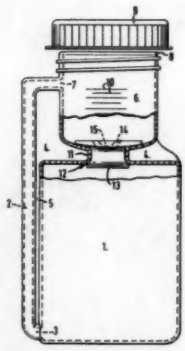
which means cooperate with the collar slot when aligned with the slot to permit actuation of the dispenser.

4,418,843

SINGLE-MOUTH SQUEEZE-BOTTLE DISPENSING CONTAINER

Anthony D. Jackman, Weybridge, England, assignor to Bettix Limited, New Malden, England

Filed Feb. 23, 1982, Ser. No. 351,461
Claims priority, application United Kingdom, Mar. 2, 1981, 8106546; May 8, 1981, 8114203; May 29, 1981, 8116550
Int. Cl.³ G01F *11/26, 11/08*
U.S. Cl. 222—158 **10 Claims**



1. A squeeze-bottle liquid-dispensing container having a single mouth and comprising a liquid-holding bottle having a neck defining a throat in alignment with said mouth, a measuring and dispensing receptacle in fluid connection with said mouth, a liquid-transfer duct extending from close to the bottom of the bottle to the receptacle, all moulded as an integral whole from resiliently flexible material, and a plug, insertable through the mouth of the container, completely closing the throat of said neck of the bottle, whereby liquid can be transferred from the bottle through the duct to the receptacle by squeezing the bottle to reduce its volume.

4,418,844

MOVABLE GRANULATE HOPPER FOR INJECTION MOLDING MACHINE

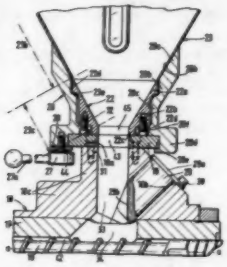
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,067

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046348

Int. Cl.³ B29F *1/00*

U.S. Cl. 222—162 **8 Claims**



1. A structure supporting a raw material hopper on the injection unit of an injection molding machine, for the gravity feed of granulate raw material from the hopper into the plastification cylinder of the injection unit, the hopper supporting structure comprising in combination:

a mounting hub on the injection unit having an upwardly facing mounting face and a charge chute in the form of a bore which extends from the mounting face into the plastification cylinder;

a lower section on the hopper in the form of a truncated sheet metal cone;

a hopper extension at the lower end of the cone forming an outwardly recessed continuation of the hopper wall;

a cup-shaped hopper base having on its upper end a supporting collar with a conical inner surface engaging a portion of the outer surface of the lower hopper section just above the hopper extension and, therebelow, a recessed inner surface portion engaging the hopper extension;

a clamping bell arranged inside the hopper base, the clamping bell having a central opening forming a conical downward continuation of the inner surface of the lower hopper section, the clamping bell including an annular clamping collar which fits against the outwardly recessed wall of the hopper extension;

means for constraining the clamping bell downwardly against the hopper base so as to clamp the hopper extension between the clamping collar of the clamping bell and the recessed inner surface of the hopper base; and

means for releasably securing the hopper base on the mounting hub of the injection unit.

4,418,845

GRANULATE HOPPER FOR HORIZONTALLY AND VERTICALLY INJECTING INJECTION MOLDING MACHINES

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 329,068

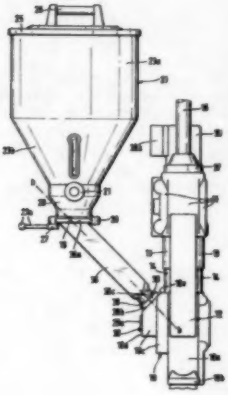
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046387

Int. Cl.³ B29B *5/02*; B67C *9/00*

U.S. Cl. 222—162 **10 Claims**

1. A structure for mounting a raw material hopper on the injection unit of an injection molding machine in such a way that it is possible for the normally horizontally oriented injection unit to be reoriented vertically, for vertical injection, and for the hopper attachment to be converted from its normal configuration in which the hopper is perpendicular to the horizontal plastification cylinder to a configuration in which the hopper is parallel to the vertical plastification cylinder, for a gravity flow of raw material from the hopper into the plastification cylinder in either orientation, the hopper mounting structure, as seen in the normal orientation, comprising in combination:

a mounting hub associated with a rearward portion of the plastification cylinder of the injection unit, the mounting hub having an upwardly facing primary mounting face surrounding a vertical primary charge chute in the form of a bore which leads from the primary mounting face into the plastification cylinder, and the mounting hub further having a secondary mounting face arranged to the rear of the primary mounting face and surrounding a secondary charge chute which is inclined rearwardly from the primary charge chute by an acute angle of at least approximately 45 degrees and leads from the secondary mounting face into the plastification cylinder;



a hopper base formation arranged at the discharge end of the hopper by means of which the hopper is attachable to the primary mounting face of the mounting hub, so that the discharge opening of the hopper is connected to the primary charge chute of the mounting hub; and

an adapter post in the form of a straight hollow member, the adapter post having a lower attachment face by which it is attachable to the secondary mounting face of the mounting hub in such a way that its bore forms an inclined adapter chute in communication with the inclined secondary charge chute, the adapter post having an upper attachment face which is inclined to the axis of the adapter post by approximately the same acute angle by which the secondary charge chute is inclined to the primary charge chute, so as to be oriented substantially perpendicularly to the axis of the plastification cylinder, whereby the upper attachment face of the adapter post is capable of serving as a raised horizontal mounting face for the hopper base formation, when the injection unit is reoriented for vertical injection.

4,418,846

AEROSOL DISPENSING SYSTEM

Richard G. S. Pong, Passaic Park; Arun Nandagiri, Dover; Oleh M. Bilynskyj, East Hanover, and Le Roy Hunter, Randolph, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 136,206, Apr. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 84,687, Oct. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 973,261, Dec. 26, 1978, abandoned. This application Dec. 29, 1980, Ser. No. 221,234

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.³ B67D *5/58*

U.S. Cl. 222—189 **13 Claims**

1. A dispenser adapted to dispense a pressurized aerosol comprising a valve means and a tubular diptube means, said tubular diptube having an open lower end and being (1) in fluid communication with said valve means and (2) formed of a lipophilic material having multidirectional pores randomly distributed throughout at least a substantial portion of its mass, characterized in that said pores permit the passage substantially only of lipophilic liquid therethrough.

4,418,847

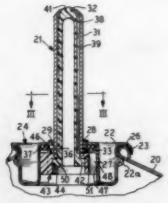
TIP SEALING TILT VALVE STRUCTURE FOR VISCOUS FLOW LIQUIDS

Walter C. Beard, South St., Middlebury, Conn. 06762

Filed Jul. 2, 1982, Ser. No. 394,517

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—402.23 **9 Claims**



1. A fluid dispensing valve structure for dispensing the contents of a pressurized container comprising:

a mounting cup member secured to said pressurized container and having communications with the pressurized contents of said container,

a resilient seal member carried in said mounting cup member,

an elongated tubular nozzle means having a dispensing orifice in one end thereof and having a second end supported in said mounting cup member by said resilient seal member in a generally straight upright extended position,

a moveable valve cup member axially slidably carried within said mounting cup member and normally being biased against said resilient seal member to form a first seal means for the contents of said container, said moveable cup member includes a flexible valve stem member extending through said tubular nozzle means and having a tip portion being normally biased in a sealing orientation relative to said dispensing orifice to form a second tip seal means for the contents of said container, and

means to open both said first and said second seal means to dispense the contents of said pressurized container when said elongated tubular nozzle means is tiltably displaced relative to its generally straight upright extended position, thereby concurrently flexing said flexible valve stem member.

4,418,848

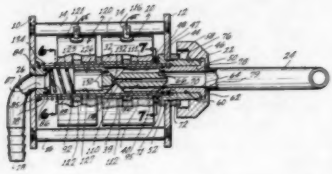
ELECTRICALLY CONTROLLED IN-LINE DISPENSING FAUCET

John A. Lunau, Pfaffenberger Weg. 270, Bruhler Str. 49-51, D-5650 Solingen, Fed. Rep. of Germany

Division of Ser. No. 108,372, Dec. 31, 1979, Pat. No. 4,336,896. This application Sep. 21, 1981, Ser. No. 304,186

Int. Cl.³ B67D *3/00*; F16K *31/02*

U.S. Cl. 222—504 **1 Claim**



1. In an electrically operated in-line dispensing faucet, in combination, tubular means having an inlet flow tube and outlet flow tube, means forming a valve seat in the tubular means, valve means including at least one valve in the form of a plunger which is reciprocatable in the tubular means, said plunger being in the form of a hollow cylinder having a tapered nose part, the nose part having flow channel means formed in it spaced from the central axis of the plunger, and electromagnetic means positioned around the tubular means for producing reciprocating movement of the said plunger means, including a second plunger having a nose part cooperable with the said valve seat and having flow channel means through it, the said nose part of said first mentioned plunger having cooperative engagement with the second plunger, the flow channel means being provided for a flow through the first plunger and then through the second plunger.

4,418,849

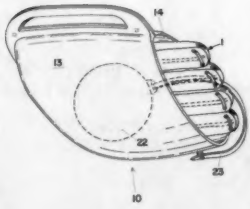
BASEBALL GLOVE FORMER & CARRIER

Richard E. Santa, 217 West End Ave., San Rafael, Calif. 94901

Filed Sep. 24, 1981, Ser. No. 305,123

Int. Cl.³ A41D *1/00*; D06C *15/00*; A41D *13/10*

U.S. Cl. 223—78 **6 Claims**



1. A former and carrier for baseball glove formed in two sections hinges about a natural crease extending downward

from between thumb and forefinger to the heel thereof, said former end carrier comprising:

a clam shell-like, integrally molded, elastic plastic body, having opposing side panels and an intermediate hinge portion;

each of said panels being of a size and shape to accommodate one section only of a baseball glove folded about said natural crease with the back of said glove along said natural crease overlying and disposed along said hinge portion; and

means forcing said side panels toward each other so that sufficient pressure is applied and maintain upon a glove contained therebetween to preserve the location and integrity of said natural crease.

4,418,850

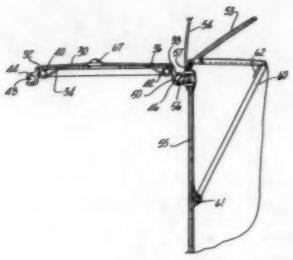
PANNIER AND MOUNTING ARRANGEMENT FOR CYCLES

W. Shaun Jackson, 809 Sycamore, Ann Arbor, Mich. 48104, and Leslie E. Bohm, 29560 Rutherland, North, Southfield, Mich. 48076

Continuation of Ser. No. 84,400, Oct. 24, 1979, abandoned, Continuation-in-part of Ser. No. 768,467, Feb. 14, 1977, Pat. No. 4,174,795. This application Jan. 15, 1982, Ser. No. 339,273

Int. Cl.³ B62J *9/00*

U.S. Cl. 224—32 A **4 Claims**



1. A pannier adapted to be secured to the side of a cycle vehicle, said vehicle including a longitudinally extending fastener on the side thereof for mounting said pannier on said vehicle, comprising:

a generally rectangular bag formed of flexible sheet material, said bag having a top provided with an access opening therein and a plurality of sidewalls, and a flap pivotally joined to one of the sidewalls along a hinge line for selectively covering the access opening;

a substantially rigid panel disposed within said bag and secured to one of the sidewalls of said bag, the upper extremity of said panel being disposed below said hinge line;

a generally U-shaped bar disposed within said bag and having the opposite ends thereof pivotally mounted on one side of said panel at a location spaced below said top of said bag, said bar having an intermediate section secured to another of said sidewalls adjacent said top, said bar extending upwardly and outwardly from said panel whereby to maintain said top of said bag in an extended position, said bar being pivotable toward said panel to hold said top of said bag into a retracted position; and

a longitudinally oriented, elongate slide member secured to the other side of said panel adjacent said top of said bag, said slide member extending laterally from said bag and matingly engaging said slide fastener for suspending said bag on said vehicle, essentially the entire weight of the pannier being distributed along the length of said slide member.

4,418,851

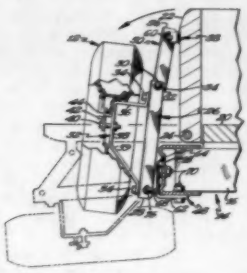
VEHICLE SPARE TIRE CARRIER

V. Scott Ankeny, Blue Earth, Minn., assignor to Tufco Equipment Company, Blue Earth, Minn.

Filed Nov. 27, 1981, Ser. No. 325,478

Int. Cl.³ B62D *43/02*

U.S. Cl. 224—42.06 **12 Claims**



4. A spare tire carrier for a vehicle having a closure pivotally mounted about a pivot axis from a first closed position to a second open position comprising, in combination: a first arm having a first end and a second end; means for simultaneously pivoting the first arm from a first position to a second position with the closure of the vehicle comprising, in combination: means for pivotally mounting the first end of the first arm to the vehicle about an axis parallel to the pivot axis of the closure; a second arm having a first end and a second end, with the first end of the second arm being pivotally mounted to the second end of the first arm about an axis parallel to the pivot axis of the closure; and means for pivotally mounting the second end of the second arm to the closure of the vehicle about an axis parallel to the pivot axis of the closure; and means for mounting the spare tire to the spare tire carrier.

4,418,852

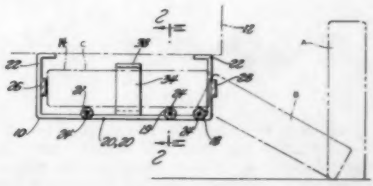
SPARE WHEEL-TIRE CARRIER

Israel M. Grinwald, Southfield, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 17, 1982, Ser. No. 389,198

Int. Cl.³ B62D *43/04*

U.S. Cl. 224—42.23 **1 Claim**



1. A carrier for wheel-mounted tires that attaches to the undersurface of a vehicle comprising;

a frame structure that includes two horizontal bars parallel to each other, said bars being widely spaced apart by a distance approximately the same as the diameter of the tire to be supported, an upstanding suspension arm at each end of each bar, means at the upper end of each suspension arm for affixing the carrier to the vehicle; the suspension arms being rigidly affixed to the horizontal bars and to the vehicle so that the defined frame structure is immovable relative to the vehicle;

first, second and third circular rods extending transversely

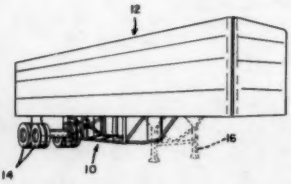
between the horizontal bars, each rod having its ends rigidly to the associated horizontal bars such that the rods act as structural reinforcements for the frame structure;

first, second and third roller sleeves freely rotatable encircling respective ones of the rods, the roller sleeves being slightly shorter than the space between the parallel bars, whereby each roller sleeve can slide a limited distance along its rod parallel to the rod axis to accommodate slight off-center positions of a tire; the first roller sleeve being located in close proximity to one set of suspension arms at the outermost ends of the horizontal bars, whereby a mounted tire can be positioned in an inclined attitude resting partly on the ground and partly on the first roller sleeve, after which the mounted tire can be lifted to a horizontal attitude and then moved over the three roller sleeves to a retained position within the space circumscribed by the upstanding suspension arms, said three roller sleeves providing the entire support for a mounted tire inserted into the space above the roller sleeves;

the second and third roller sleeves being spaced equal distances from an imaginary transverse line through the geommetrical center of the mounted tire when it is supported on the roller sleeves, said second and third roller sleeves being widely spaced from the center of gravity of the supported tire;

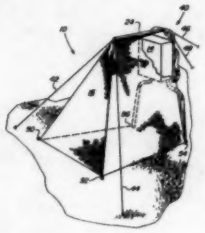
two upstanding bars carried by respective ones of the aforementioned horizontal bars, said upstanding bars being located on the aforementioned transverse line through the geommetric center of the mounted tire, the upstanding bars being spaced apart a distance slightly greater than the diameter of the tire in its retained position, whereby lateral motion of the tire is prevented; each upstanding bar having an inturned flange at its upper end to closely overlie the tire whereby vertical jarring forces associated with a moving vehicle are prevented from disturbing the tire position.

4,418,853
PALLET CARRIER
James D. Shaffer, Mechanicsburg, Pa., assignor to Goodway Transport, Inc., York, Pa.
Filed Aug. 30, 1982, Ser. No. 412,582
Int. Cl.[3] B60R *9/00*; B62D *25/20*
U.S. Cl. 224—42.41 **11 Claims**



1. An open frame carrier adapted to be suspended from the bottom of a semi-trailer forward of the rear wheels for transporting pallets or the like, the carrier comprising a support frame having a width approximating the width of the trailer and a plurality of support bars secured to and extending upwardly from the support frame, the bars being arranged in transverse rows across the width of the support frame and each including connection means on the upper end for attaching the bar to the bottom of the trailer, the rows of bars being spaced along the front-to-back length of the support frame to define a plurality of bays opening on both sides of the carrier, the support frame including longitudinally extended outer rails, a center rail located below the outer rails and a plurality of transversely extending support bars joining the outer rails and center rail so that the support bars angle downwardly from the outer rails to the center rail to aid in retaining pallets or the like in the bays, each bay including at least two spaced support bars for supporting a plurality of pallets or the like loaded in the bay, means for selectively opening or closing the bays on the lateral sides of the carrier to permit either loading, unloading or retention of pallets or the like into or from the bays, and a first stiffening member secured at a lower end to the support frame and angling upwardly to an upper end adapted to be secured to the bottom of the trailer to stiffen the carrier against front and back movement and a second stiffening member secured at a lower end to the support frame and angling upwardly therefrom across the width of the carrier to an upper end permanently secured to stiffen the carrier against lateral movement.

4,418,854
BACKPACK SHELTER APPARATUS
Joseph Genovese, 156 West Ivanhoe, Chandler, Ariz. 85224
Filed Nov. 25, 1981, Ser. No. 325,091
Int. Cl.[3] A45F *4/04*
U.S. Cl. 224—154 **9 Claims**



1. A backpack shelter apparatus, comprising:

foldable shelter means adapted for folding into said backpack for storage;

a frame having a pair of legs and member means that are foldable about said shelter means when in the folded position for permitting said backpack, frame and shelter means to be mounted on the back of a person and for forming a cantilever with said shelter means adapted for placement over said frame and said cantilever to form an enclosure wherein said backpack remains connected to said frame;

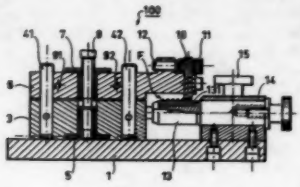
said pair of legs each including double elbow means operably disposed proximate the midsection of said legs, said double elbow means being operatively rotatable in any rotational direction for forming said pair of legs into a collapsed U-shaped configuration adapted for retainably receiving said folded shelter means therein and said member means being hingedly secured to said pair of legs for closing over the top of said folded shelter means and for extending downwardly between the ends of said legs and substantially parallel thereto for removeably retaining said folded shelter means in a portable backpack configuration, said double elbow means being further operative for rotating said pair of legs for forming a pair of elongated extended S-shaped members and said member means folding upward such that said cantilever formed by said member means extends substantially horizontally outward from the plane of the upper portion of said pair of legs and is substantially perpendicular to said plane, said cantilever means and said legs forming a frame over which said unfolded shelter means is supported for forming a tent-like shelter or the like; and

means for fixedly locating the lower distal end of said pair of legs when in said elongated, extended, S-shaped configuration, on the ground.

4,418,855
TOOL UNIT FOR COLLECTIVE BREAKING OF OPTICAL FIBRES

Dominique Lamarche, and Marie C. Soster, both of Suresnes, France, assignors to SOCAPEX, Suresnes, France

Filed Jul. 29, 1981, Ser. No. 287,945
Claims priority, application France, Jul. 31, 1980, 80 16917
Int. Cl.³ C03B *37/16*
U.S. Cl. 225—96 **12 Claims**



1. A tool unit for the collective breaking of optical fibers comprising:

first means defining a reference plane and a direction of translational motion parallel to the reference plane;

second means defining a straight bearing line for supporting the optical fibers at the apex of a convex surface, the straight bearing line being parallel to the direction of translational motion;

third means for placing a cutting-tool above the reference plane while permitting translational movement of said tool along a straight line parallel to the bearing line so that the cutting portion of the tool is consequently capable of scoring all the fibers which are located on the straight bearing line; wherein

said first means includes a platform rigidly fixed to a translational-motion guide strip having one face parallel to said translational-motion line; wherein

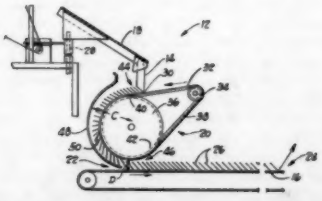
said second means includes at least one clamping means for clamping the fibers in a plane containing the bearing line; and wherein

said third means includes a cutting-tool support means for supporting said cutting tool and for permitting sliding movement thereof along said guide strip, and fine adjustment means for establishing the optimum height of the cutting-tool above said reference plane.

4,418,856
APPARATUS FOR PLAITING TOW ONTO A CONVEYOR

Kurudamannil A. George, Philadelphia, Pa., assignor to Proctor & Schwartz, Inc., Horsham, Pa.

Filed Jan. 14, 1980, Ser. No. 111,544
Int. Cl.³ B65H *17/42*
U.S. Cl. 226—118 **6 Claims**



1. An inverting tow plaiter for handling at least one continuous length of tow and for depositing said tow onto a receiving end of a main conveyor, in such orientation as to permit trouble-free removal of said tow from an opposite discharge end of said main conveyor, the combination with said main conveyor comprising

(a) means defining an elongated transversely extending upper tow receiving area and an elongated transversely extending lower tow discharge area, said discharge area being substantially contiguous with said main conveyor receiving end;

(b) a continuously moving roughened surface defined by a rough belt running on a cylindrical drum and extending along a semi-circular path between said tow receiving area and said tow discharge area;

(c) means for laying down tow in said tow receiving area in overlying laps extending back and forth in an axial direction relative to said drum on said roughened surface, said roughened surface having an axial length sufficient to accommodate the tow laps;

(d) a generally semi-circular housing having an axis parallel to and generally in the same vertical plane as the axis of said drum, said housing axis being located above the axis of said drum, said housing being spaced from said roughened surface and generally axially coextensive therewith, and extending from at least near said tow receiving area to said tow discharge area, whereby said housing defines with the roughened surface a curved chute of continuously narrowing cross-section having a wider gap in the tow receiving area than in the tow discharge area, the radial gap in the tow discharge area being at least one third the tow average width but sufficiently small to maintain contact of the tow with the roughened surface to said discharge area;

(e) said roughened surface having a speed of rotation approximately the same as the main conveyor;

(f) said laps inverting in orientation by rotation about a longitudinal marginal edge of said tow in passage in said curved chute between the receiving area and the tow discharge area.

4,418,857
HIGH MELTING POINT PROCESS FOR AU:SN:80:20 BRAZING ALLOY FOR CHIP CARRIERS

Norman G. Ainslie, Croton-on-Hudson, N.Y.; James E. Krzanowski, Watertown, Mass., and Paul H. Palmateer, Wappingers Falls, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,606
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—124 **18 Claims**

1. In a process of brazing metallic elements to a substrate in a thin film electronic circuit package wherein said substrate carries said metallic elements and solder connections supporting a plurality of chips on said substrate, with the metallic elements brazed to said substrate by means of a gold tin brazing solder, the improvement comprising providing a source of a Group IB metal and a thin film source of a Group VIII metal within a thickness of up to about 1.25 μm thick coating said Group IB metal, said Group VIII metal being adjacent to said gold tin solder, said Group IB metal, said Group VIII metal in combination with said brazing solder coming into contact with

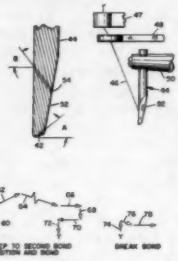
said metallic elements during brazing, whereby the melting temperature of said brazing solder is raised substantially during brazing to a value above the melting temperature of said solder connections.

4,418,858

DEEP BONDING METHODS AND APPARATUS

C. Fredrick Miller, 2165 N. Glassell, Orange, Calif. 92665

Filed Jan. 23, 1981, Ser. No. 227,806
Int. Cl.³ H01L *21/90*
U.S. Cl. 228—159 10 Claims



1. A deep bonding tool for use in a sonic, wire bonding machine, said tool comprising:

a body including a shank section;

a tapered section extending from the shank section to an end which is smaller in cross-sectional area than the shank section;

said end being formed with a first anvil-shaped end portion extending beyond a second end portion;

a wire feed hole of size to accommodate a bonding wire and extending from a first opening at said end of the body between said first anvil-shaped end portion and said second end portion to a second opening at the side of said body in said tapered section; and

wire bow preventing means for cooperation with said feed hole to prevent lateral bowing of the wire at the side of the feed hole toward said shank when the wire is forced in the direction toward said feed hole, said bow preventing means being formed as a passage of size to accommodate the bonding wire and extending through the shank of the tool and an opening at the juncture of said tapered section and said shank section.

7. In a wire bonding process conducted with a sonic bonding tool having an anvil end and a feed hole for a bonding wire which extends through the feed hole and emerges at the anvil end of the tool and in which the wire is to be broken, after being bonded to a second circuit point, the step of breaking the wire adjacent said second point by;

pulling out a length of wire sufficient to underlie said anvil end and bending the end of the wire under the anvil end by raising the tool vertically from the second bond point while permitting the tool to move over the wire relative to the wire on said feed hole;

thereafter moving the tool downwardly and away from and not toward the second circuit point; and

thereafter moving the tool away from said second circuit point while holding the wire against motion relative to the tool at said feed hole.

4,418,859

METHOD OF MAKING APPARATUS FOR THE EXCHANGE OF HEAT USING ZIRCONIUM STABILIZED FERRITIC STAINLESS STEELS

Thomas M. Devine, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 268,458, May 29, 1981, abandoned.
This application Sep. 30, 1982, Ser. No. 429,750
Int. Cl.³ B23K *31/06*; C22C *38/28*
U.S. Cl. 228—183 3 Claims

1. In the method for making an apparatus for the exchange of heat in which a plurality of thin walled tubular metal members are formed, finned and welded to tube sheets in an array with gaps between said members, the improvement of using as the metal for the walls of said members a zirconium stabilized corrosion resistant ferritic stainless steel consisting essentially of, in weight percent:

Carbon=0.025% max
Nitrogen=0.025% max
Carbon+Nitrogen=0.045% max
Silicon=1.0% max
Manganese=1.0% max
Phosphorous=0.04% max
Sulfur=0.03% max
Chromium=18–20%
Molybdenum=1.75–2.25%
(Zirconium/Carbon)≧18

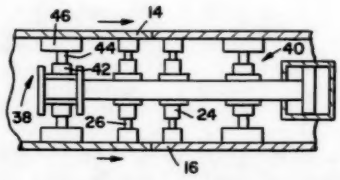
the balance being iron and incidental impurities.

4,418,860

CLAMPING METHOD AND APPARATUS FOR SOLID PHASE WELDING

Jean LaForce, Inverness, Calif., assignor to Carl Stringer, Pearland; Stringer Oil and Gas Company, Inc., San Angelo and Carl T. Stringer, Houston, all of, Tex.

Filed Jun. 29, 1981, Ser. No. 278,488
Int. Cl.³ B23K *37/04*
U.S. Cl. 228—196 7 Claims

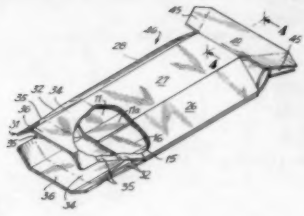


1. A method of solid phase welding adjacent ends of axially aligned pipes which include placing the ends of two pipes into substantially axial alignment and into adjacent relationship, placing within each pipe substantially immediately adjacent its end a first plurality of circumferentially spaced pipe bore engaging pads secured to a first set of radially extensible elements, effecting radial outward pressure on said elements causing said first pads to exert like pressure on said pipe adjacent its end and causing such end to assume a circular configuration, said first pads having a first dimension extending axially of said pipe, placing a second set of radially extensible elements axially inwardly of said first set adjacent the wall of each pipe, said second set of elements having pipe engaging pads secured to said second set of radially extensible elements, with said second pads having a second dimension extending axially of said pipe substantially greater than said first dimension, effecting radial pressure on said second elements causing said second pads to clamp the wall of its associated pipe, and then moving at least one group of said second elements axially inwardly and towards the other group of said second elements to bring said pipe ends into forcible engagement.

4,418,861
HEXAGONAL CONTAINER

William W. McFarland, Georgetown, and Baxter Beavers, Pawley's Island, both of S.C., assignors to International Paper Company, New York, N.Y.

Filed Feb. 23, 1982, Ser. No. 351,395
Int. Cl.³ B65D 13/00, 5/32
U.S. Cl. 229—23 A 6 Claims



1. A hexagonal paperboard container, which comprises:
(a) a one-piece, upstanding, generally tubular, reinforcing member consisting of six, foldably connected, substantially rectangular, upstanding, reinforcing panels;
(b) a one-piece body member having two sets of three, substantially rectangular, foldably connected, upstanding side wall panels and a bottom wall foldably connected along its opposite sides to the central side wall panel of each set of side wall panels;
(c) the sets of side wall panels being located on opposite sides of the tubular reinforcing member and the side wall panels being bonded to the reinforcing panels;
(d) two of said reinforcing panels which are bonded to the central side wall panels having abutting major flaps foldably connected thereto at the bottom edges thereof;
(e) the four remaining reinforcing panels having minor flaps foldably connected thereto at the bottom edges thereof;
(f) said major and minor flaps extending substantially horizontally and interengaging and fitting together non-overlappingly to form an integral, coplanar, unsecured bottom wall for the reinforcing member which lies above and completely covers the bottom wall of the body member whereby a double-thickness container bottom wall is formed.

4,418,862
HEXAGONAL BOX

Steen Vesborg, Copenhagen, Denmark, assignor to Colgate-Palmolive Company, New York, N.Y.

PCT No. PCT/DK80/00079, § 371 Date Jul. 20, 1981, § 102(e) Date Jul. 20, 1981, PCT Pub. No. WO81/01694, PCT Pub. Date Jun. 25, 1981
PCT Filed Dec. 5, 1980, Ser. No. 285,130
Claims priority, application Denmark, Dec. 7, 1979, 5215/79
Int. Cl.³ B65D 5/08, 5/36
U.S. Cl. 229—41 C 6 Claims

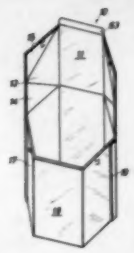
1. A cut and scored blank suitable for producing a hexagonal box comprising

a first side wall section having three rectangular panels articulated in succession by parallel fold lines,

a second side wall section having three rectangular panels articulated in succession by parallel fold lines,

a top cover section having a central rectangular flap and two rectangular side flaps articulated in extension from said first side wall section on the first parallel fold lines over a fold line perpendicular to the first parallel fold lines, the rectangular side flaps being scored to enable folding each of the side flaps to form one larger triangular area and two smaller triangular areas,

such that, upon folding of the blank to form a hexagonal box, the distal end of the central rectangular flap is in abutment with

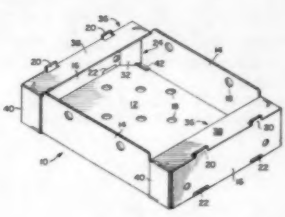


the free end of the center rectangular panel of the second side wall section.

4,418,863
PRODUCE TRAY WITH REINFORCED CORNER CONSTRUCTION

Melvin D. Kimbrell, Sr., deceased, late of Burlingame, Calif. (by Melvin D. Kimbrell Jr., executor), assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Sep. 2, 1982, Ser. No. 414,496
Int. Cl.³ B65D 5/22, 5/26
U.S. Cl. 229—49 7 Claims



1. A rectangular tray suitable for produce such as cauliflower and the like comprising:

a panel blank providing pairs of opposed side and end walls hingedly connected to and extending upwardly from the edges of a bottom wall to substantially define the dimensions of said tray;

a corner flap extending longitudinally from a first of said side walls, said flap being folded into a columnar configuration at the end of said side wall;

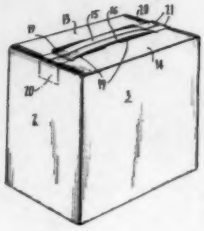
a top flap extending upwardly from one of said end walls that adjoins said first side wall, said top flap being folded down to provide a partial top wall overlying said columnar configuration;

a locking flap extending longitudinally from said top flap and having a holding tab on an edge thereof, said locking flap being folded down to lie along the outside of said first side wall;

a slot formed on said panel blank with said holding tab being engaged in said slot to maintain said walls in the tray configuration; and

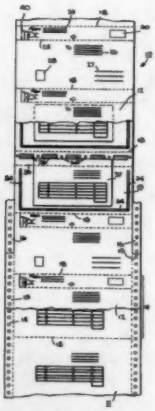
retaining means cooperating with said corner flap to retain said columnar configuration disposed between said bottom wall and said partial top wall, the free edge of said corner flap being notched to accommodate said holding tab.

4,418,864
CARTON WITH HANDLE
John C. Nielsen, St. Clair, Australia, assignor to Visymonde Investment PTE Ltd., Singapore, Japan
Filed Sep. 24, 1982, Ser. No. 423,470
Claims priority, application Australia, Dec. 21, 1981, PF2026
Int. Cl.³ B65D *5/46, 25/28*
U.S. Cl. 229—52 B **9 Claims**



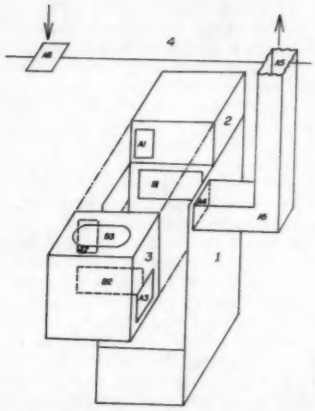
1. A carton having side walls and end closing flaps, said carton including at one end a pair of inner closing flaps and a pair of outer covering flaps, said outer covering flaps having their edges in substantially abutting relationship along a line extending substantially across the middle of the carton, said outer flaps each having portions adjacent their free edges which are at least substantially separable from said flaps, and a strip of reinforcing tape overlying said portions of said outer flaps and secured to the side walls of said carton to define with said portions a carrying handle for said carton.

4,418,865
CONTINUOUS MAILER ASSEMBLY
Charles G. Bowen, Patterson, N.Y., assignor to Transkrit Corporation, Elmsford, N.Y.
Filed Aug. 5, 1981, Ser. No. 290,318
Int. Cl.³ B65D *27/10*
U.S. Cl. 229—69 **17 Claims**



1. A mailer consisting of
a front ply for receiving information thereon, said front ply including a body portion having a designated address area thereon and a removable tab portion adjacent said body portion;
a back ply peripherally secured to said front ply with a U-pattern of adhesive inserted after "front ply"; to define a first enclosed pocket therewith, said back ply having a main portion secured to said body portion of said front ply to define a return mail pocket therewith, and a flap portion underlying said tab portion for folding over onto said body portion after removal of said tab portion;
at least one insert message ply within said first pocket and within, and free of attachment to, said U-pattern of adhesive and extending outwardly of said first pocket to between said tab portion and said first portion;
releasable glue spots releasably securing said tab portion to said flap portion; and
adhesive means on said flap portion for sealing against said body portion.

4,418,866
HEAT RECOVERY
Theodore W. Workman, P.O. Box 828, Parsons, Kans. 67357
Continuation-in-part of Ser. No. 158,527, Jun. 11, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 312,544
Int. Cl.³ F24B *7/00*
U.S. Cl. 237—55 **3 Claims**



1. In a room space heating method wherein air is cyclically blown from an initial position into and through a furnace heating zone and thence passing as heated air along a heated air path to enter a room space, with air from the room space passing along a return path to the initial position, and wherein air is heated in the furnace heating zone by heat exchange with a furnace combustion zone with combustion products produced in the latter being vented to atmosphere along a flue gas path, the improvement comprising diverting a portion only of the heated air passing along the heated air path to pass along a separate auxiliary heated air path to enter a room space, and effecting a heat exchange between combustion products traveling along the flue gas path with diverted heated air traveling along the auxiliary path, whereby a portion of the furnace heated air is diverted from passing to the room space to pass in heat exchange relation with hot combustion products for additional heating prior to entering a room space, wherein the separate auxiliary heated air path comprises a secondary heat exchanger at an upper side part of said furnace, wherein said furnace includes a base portion (2) at the top thereof having an opening (A1) in a side wall, said furnace further including a secondary heat exchanger (3) having an opening (A2) in a side wall to receive air from said base portion, said furnace having a flue gas outlet (B1) in a side wall thereof to receive flue gas from a primary heat exchanger, said secondary heat exchanger further including an opening to receive flue gas (B2) in a side wall thereof and an opening to exit flue gas in a top wall (B3) thereof, said secondary heat exchanger further including an

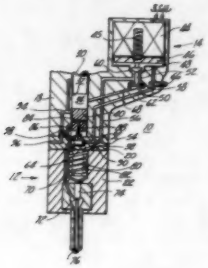
opening (A3) in a side wall thereof wherein heated air is supplied to a supply run (A5), wherein the heated air and the auxiliary heated air paths direct heated air entry into the room space at positions remote from each other.

4,418,867

ELECTRICALLY CONTROLLED UNIT INJECTOR

Albert E. Sisson, Farmington Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 2, 1982, Ser. No. 364,813
Int. Cl.³ F02M 47/02
U.S. Cl. 239—88 **12 Claims**



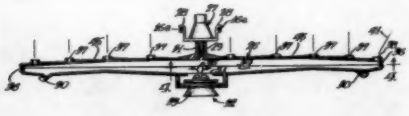
1. An integer for controlling the flow of fuel from a source to an internal combustion engine having a body having a bore formed therein, a primary plunger actuated in response to engine rotation and a metering plunger, means for reciprocating said primary plunger; a timing chamber formed between the primary plunger and said metering plunger, a metering chamber partially defined by said metering plunger; said injector comprising: a three way valve means for controlling the flow of fuel to said timing and metering chambers comprising a first valve means for controlling fuel flow to the timing chamber, and a second valve means controlling fuel flow to the metering chamber, said first valve means being in one position to admit fuel to said timing chamber and in a second position to seal said timing chamber, said second valve means being in a first position to permit the flow of fuel to said metering chamber and being in a second position to shut off the flow of fuel to said metering chamber.

4,418,868

DISHWASHER UPPER SPRAY ARM

Vincent P. Gurubatham, St. Joseph, and James G. Ruspino, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 29, 1981, Ser. No. 268,290
Int. Cl.³ B05B 3/00, 3/02
U.S. Cl. 239—228 **8 Claims**



1. A rotary spray means for an article washing apparatus comprising:

an elongated hollow interior structure having a central axis of rotation and a plurality of arms extending from said axis, said arms having a hollow interior constricting from adjacent said central axis to an outer end of each arm, and each arm having an upper portion;

entrance passage means to said hollow interior coinciding with said axis of rotation for receiving a pressurized stream of liquid;

a plurality of nozzles spaced from said axis of rotation along said upper portion of each said arm, each nozzle extending transversely to the direction of elongation of said arms and having an entrance end opening to said hollow interior, and an exit end, said entrance end having a cross sectional dimension transversely to the longitudinal extent of said arms less than the transverse width of the arms thereat; and

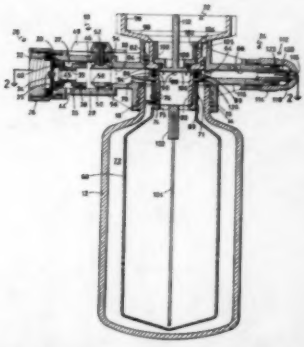
a plurality of liquid supply ramp means each leading from the said hollow interior to the inner entrance end of a corresponding one of a plurality of said nozzles, each said ramp means comprising a groove in said arm upper portions and having a width substantially equal to the cross-sectional dimension of the nozzle entrance end, said groove being angled outwardly from said hollow interior and extending to and through one side of said entrance end of said one nozzle, and the opposite side of said one nozzle forming a solid wall angled thereto so as to redirect the liquid from said groove outwardly through said one nozzle.

4,418,869

HOSE MOUNTED FLUID MIXING SPRAYER

James W. Healy, 54 Plymouth Rd., Wakefield, Mass. 01880

Continuation-in-part of Ser. No. 78,246, Sep. 24, 1979, abandoned. This application Jan. 15, 1981, Ser. No. 225,208
Int. Cl.³ B05B 7/30
U.S. Cl. 239—317 **2 Claims**



1. A sprayer having means for attaching it to the neck of a bottle comprising

a hollow body defining a water inlet passage for connection to a water supply under line pressure, a rectilinear mixing passage and an outlet passage from said mixing passage to a nozzle,

adjustable metering means adjacent and in communication with said mixing passage,

said metering means comprising an apertured ring integral with a sub-assembly insertable within said hollow body and having a series of metering apertures of predetermined size,

said sub-assembly being provided with means for manually rotating said sub-assembly to place a desired metering aperture in communication with said mixing passage,

a bladder located below and in communication with said metering means for containing an additive to be metered into the water stream in said mixing passage through said metering means, said bladder being adapted to be inserted within said bottle when said sprayer is attached thereto so as to define with the interior surface of said bottle an enclosed space,

means for supplying water under line pressure from said inlet passage to said enclosed space, and

means for reducing the pressure within said body and said enclosed space to that of the atmosphere when said water supply is turned off and for restoring to and maintaining said pressure at line pressure when said water supply is turned on,

said means for manually rotating said sub-assembly comprising a funnel shaped portion of said sub-assembly extending upwardly from said apertured ring and above said hollow body and including removable closure means in the bottom of said funnel shaped portion for closing and opening the mouth of said bladder permitting, when removed, the filling of said bladder with a desired additive without disconnecting said sprayer from said bottle.

4,418,870

FUEL INJECTION NOZZLES

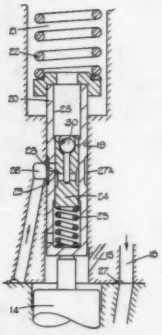
Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries plc, Birmingham, England

Filed Jun. 18, 1982, Ser. No. 390,040

Claims priority, application United Kingdom, Jul. 9, 1981, 8121231

Int. Cl.³ F02M *47/00*

U.S. Cl. 239—533.8 **4 Claims**



1. A fuel injection nozzle comprising a fluid pressure operable valve member slidable within a bore, a seating located at one end of the bore, the valve member being shaped for cooperation with said seating to prevent fuel flow from an inlet to an outlet, resilient means biasing the valve member into contact with the seating, a chamber, a valve means through which fuel under pressure can flow to said chamber, a surface in said chamber, the fuel pressure in said chamber acting on said surface to create a force which assists the action of said resilient means, said surface being defined upon a piston member which engages said valve member, said valve means including a bore formed in the piston member, one end of the bore being open to said chamber and the other end of the bore communicating with a drain, a valve element slidable in the bore, a spring biasing the valve element towards said one end of the bore whereby the position of the valve element within the bore will be dependent upon the pressure in said chamber, passage means defined by the piston and valve element, said passage means connecting said inlet with said chamber, the flow of fuel through said passage means into said chamber being prevented when the pressure of fuel in the chamber attains a predetermined value, and a non-return valve in said passage means, said non-return valve acting to prevent fuel flow through said passage means from the chamber.

4,418,871

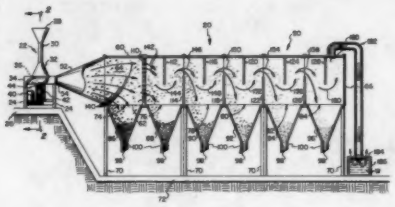
METHOD AND APPARATUS FOR REDUCING AND CLASSIFYING MINERAL CRYSTALLINE AND BRITTLE NONCRYSTALLINE MATERIAL

Stuart A. Powell, Englewood, Colo., assignor to P.V. Machining, Inc., Santa Fe, N. Mex.

Filed Jul. 15, 1981, Ser. No. 283,746

Int. Cl.³ B02C *23/08*

U.S. Cl. 241—1 **27 Claims**



1. A method of classifying crystalline material comprising:

reducing said crystalline material to a predetermined size by using a centrifugal type turbine to draw said material through an expansion cone such that a standing shock wave is set up in the expansion cone resulting in attrition grinding of the material,

directing said reduced material along a course through a classifier unit having a plurality of baffles extending alternately from the bottom and from the top of said unit into the body of the unit, thereby defining a plurality of vertical motion reverses through the unit, and

collecting the material which falls from the course at each vertical reverse, thereby classifying said material.

4,418,872

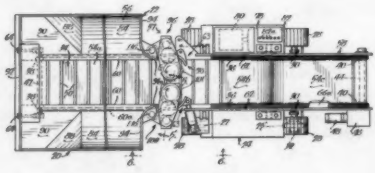
FEEDER/CRUSHER MACHINE

Robert C. Nelson, Bluefield, W. Va., assignor to Baker Mine Services, Inc., Glen Lyn, Va.

Continuation of Ser. No. 55,684, Jul. 6, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,413

Int. Cl.³ B02C *13/20*

U.S. Cl. 241—187 **6 Claims**



1. A feeder/crusher machine for use in underground mines comprising:

an elongated body with horizontally spaced receiving and discharge sections at opposite ends and a crushing section intermediate the receiving and discharge sections;

conveying means having a carrying run directly, horizontally movable from the receiving section through the crushing and discharge sections;

the receiving section having non-apertured floor portions including portions disposed outwardly of each side of the conveying means and upstanding sideboards along the outer edges thereof thereby functioning as a surge bin with the conveying run moving directly along the floor thereof, said receiving section having transverse vertical walls at the outlet end of the receiving section extending inwardly from the sideboards toward the conveying

means to define a restricted outlet regulating the flow of material into the crushing section;

the crushing section having side walls with gaps therein and arms extending through said gaps;

a pair of breaker drums having peripheral breaker elements supported on said arms adjacent opposite sides of said crushing section immediately above and adjacent to said carrying run and continuously rotatable about spaced vertical axes in a direction to move coal or mineral material on the receiving sides of said drums toward the center of the crushing section, said drums being spaced apart to provide a nip space at the center of the crushing section between said peripheral breaker elements on the respective drums for coal or mineral material to be seized by said breaker elements and crushed into lumps determined by the size of the nip space by horizontal forces reacting solely between the drums and not against the conveyor means carrying run;

guide plates supported on said arms externally of the breaker drums and located in said gaps to prevent loss of material from the crushing section;

said breaker drums being sufficiently closely adjacent to the respective sides of the crushing section and to the carrying run to limit movement of material by the conveying means past the breaker drums only through the nip space, the movement of the breaker elements in the nip space being in the same direction as the carrying run;

power means for rotating said drums simultaneously to move the breaking elements on the nip sides of the drums in the direction of movement of the carrying run to move material from the receiving section through the nip space into the discharge section; and

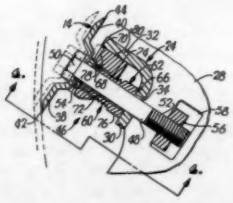
the portion of said conveying means in said receiving section being at a level closely adjacent the ground to maximize the volume of the receiving section for use as a surge bin, the portion of said conveying means in said discharge section being at a level substantially elevated above the ground so it can readily overhang a discharge point, and the intermediate portion of said conveyor means in said crushing section being inclined in a direction ascending from the level in the receiving section to the level in the discharge section.

4,418,873

CUTTING CYLINDER HAVING KNIFE POSITION ADJUSTMENT

Bruce L. Lutz, Hesston; Harold W. Voth, Newton, and Amos G. Hill, Hesston, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Dec. 3, 1981, Ser. No. 326,844
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—294 **8 Claims**



1. In a rotary cutter for reducing crop material into segments, the improvement comprising:

a generally flat knife having a longitudinal cutting edge;

a rotary support for the knife; and

means mounting said knife on the support with said cutting edge leading with respect to the direction of rotation of the support,

said mounting means including structure rendering the knife adjustably shiftable in a direction substantially normal to the flat plane of the knife for selective repositioning of said cutting edge with respect to the axis of rotation of the cutter,

said structure including a releasable retainer holding said knife on the support, and a shifter operably coupled with the knife for effecting said adjustable shifting of the knife when said retainer is released,

said shifter including a pair of interengaged relatively expandable and retractable components positioned between said knife and the support,

said components being threadably interengaged whereby relative rotation between the same produces said expansion or retraction of the shifter,

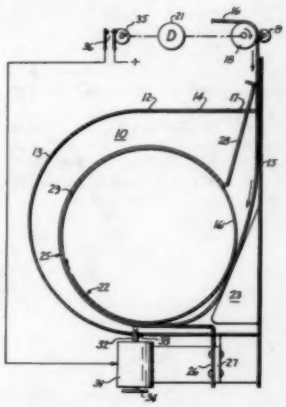
each of said components being provided with a bore therethrough which is coaxially aligned with the bore of the other component, said retainer including an elongaged, threaded member passing through said bores and through said knife, said member having an enlargement at the outer end thereof and a matingly threaded element at the inner end thereof engageable with said support and operable to cause said enlargement to be drawn tightly against said knife when the member and the element are relatively rotated in a certain direction.

4,418,874

METHOD AND APPARATUS FOR STORING A LENGTH OF WEB

Bayani E. Roldan, Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sep. 16, 1981, Ser. No. 302,872
Int. Cl.³ B65H *27/00*
U.S. Cl. 242—76 **15 Claims**



4. In apparatus for storing a length of web, the improvement comprising in combination:

means for receiving said web in a hollow space and for prompting said web into a coiled form, whereby adhesion tends to develop between turns of said web in the coiled form, effectively limiting attainable minimum web coil diameter;

means for breaking up said adhesion at least intermittently; and

means for pushing said length of web into said receiving means to form a coil of said web having a minimum diameter smaller than said limited diameter, including means for imposing on said length of web a curl assisting coiling thereof.

4,418,875
THREADING TOOL

Terence J. Brine, Haslemere, England, assignor to Roadrunner Electronic Products Limited, Surry, England

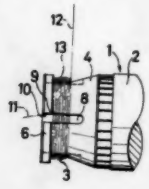
Filed Sep. 28, 1981, Ser. No. 306,470
Claims priority, application United Kingdom, Sep. 30, 1980, 8031522
Int. Cl.[3] H01B *13/00*; B21F *15/00*; B65H *49/00*
U.S. Cl. 242—7.06 6 Claims

1. A threading tool for dispensing filament material comprising an elongate body, an internal passageway extending the length of the elongate body for guiding filament material between one end of the body and the other end of the body, a dispensing nozzle at the other end of the body, the dispensing nozzle having a chamfer forming a cutting edge for the filament material, a spool for holding a supply of filament material, the spool having a pair of side discs, first means rotatably mounting said spool at said one end, a manually operable brake member extending the major part of the length of the body and having a braking portion at said one end of the body and a finger pad at said other end, and second means mounting said member for movement relative to said body from a first position in which said braking portion is out of engagement with said spool to a second position in which said braking portion frictionally engages edges of said side discs of said spool to restrain rotation of said spool, this movement being able to take place by pressure on said finger pad as filament material is dispensed and a longitudinal internal channel is formed in the body, said channel housing said brake member.

4,418,876
METHOD OF WINDING A STRAND OF RELATIVELY RIGID GLASS FIBER ONTO A ROTATING STRAND WINDING SLEEVE

Michio Sato; Shin Kasai, and Yutaka Kawaguchi, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Division of Ser. No. 96,121, Nov. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 919,647, Jun. 28, 1978, abandoned. This application May 1, 1981, Ser. No. 259,689
Claims priority, application Japan, Jun. 28, 1977, 52-85629
Int. Cl.[3] B65H *54/02*
U.S. Cl. 242—18 G 3 Claims



1. A method of winding a strand of relatively rigid glass fiber having large diameter filaments onto a rotating strand winding sleeve including a primary strand winding portion and a preliminary strand winding portion where the preliminary strand winding portion has (a) a flanged portion formed on the outer peripheral end surface thereof having a diameter which is greater than that of the preliminary winding portion, (b) at least one first groove axially provided therein, and (c) at least one second groove axially provided in the flanged portion, said first and second grooves being continuous and formed in a straight line and extending radially inward of the surface of said preliminary winding portion, said method comprising the steps of

winding the strand of relatively rigid glass fiber onto the preliminary winding portion so that the strand is slightly deformed from an arc to a straight line as it passes over said first groove to thereby enhance the frictional force between edge corners of the first groove and the wound strand,

axially pulling the first portion of the strand wound on the preliminary winding portion through the second groove in the flanged portion to effect cutting and removal thereof by one of the edge corners of the second groove,

leading the strand to the primary strand winding portion;

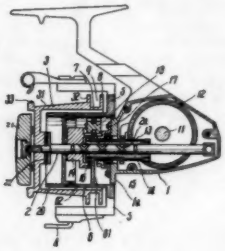
winding the strand onto said primary strand winding portion; and

inserting a knife into said first groove to cut the strand wound on the preliminary winding portion.

4,418,877
FISHING REEL

Hideki Nakajima, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 9, 1981, Ser. No. 319,285
Claims priority, application Japan, Nov. 15, 1980, 55-163672[U]
Int. Cl.[3] A01K *89/01*
U.S. Cl. 242—84.21 R 5 Claims



1. A fishing reel comprising:

a reel body having a handle;

a rotary frame comprising a cylindrical portion had having a bail arm and being rotatably supported to said reel body at the front thereof;

a transmission mechanism for transmitting an operation of said handle to said rotary frame; and

a spool provided at the front of said rotary frame, said spool comprising a cylindrical trunk supported about the outer periphery of said cylindrical portion for winding thereon a fishing line, a first flange provided on one end of said trunk at a side closest to said reel body, a second flange provided on another end of said trunk at a side farthest removed from said reel body, a cylindrical extension extending from said first flange toward said reel body, and a third flange provided at one end of said cylindrical extension and extending radially outwardly, said first flange being located closer to said third flange than said second flange to define a wide fishing line winding portion on said trunk between said first and second flanges and a narrower annular groove for receiving a fishing line formed by said first flange, said third flange and the other periphery of said cylindrical extension, said annular groove receiving a fishing line which becomes displaced from said line winding portion during casting and moves toward said reel body to prevent said displaced line from being caught by said rotary frame.

4,418,878

AUTOMATIC ROLL-UP DEVICE FOR SAFETY BELTS

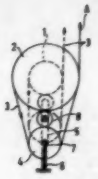
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,517

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033746

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.3 **13 Claims**



1. Automatic roll-up device for a safety belt having a winding shaft connected to a roll-up spring and to an automatic locking device and carrying a belt wed winding roll, the roll-up device also having a belt brake located downstream of the winding shaft in direction of pull of the belt web, the belt brake being in the form of a movable clamping member partly looped around by the belt web and actuatable for clamping the belt web after actuation of the automatic locking device, said clamping member comprising a brake roller partly looped around by the belt web and being rotatable in the same direction as the winding shaft, when the belt web is being unrolled and rolled-up, a housing for the automatic roll-up device on which said brake roller is movably mounted and, upon actuation of locking action by the automatic locking device, being pressable by the belt web in direction of the belt web winding roll to effect clamping and locking of the belt web winding roll, and a spacer member operatively connected with said brake roller and braced against the belt web winding roll, said brake roller being held by said spacer member at substantially constant spacing from the belt web winding roll, in non-locked condition thereof, for every diameter of the belt web winding roll.

4,418,879

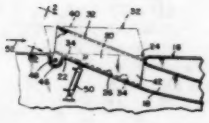
SCOOP AND INLET FOR AUXILIARY POWER UNITS AND METHOD

Siebold Vanderleest, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 29, 1980, Ser. No. 220,515

Int. Cl.³ B64D *33/02*

U.S. Cl. 244—53 B **15 Claims**



1. For use on an aircraft, an air inlet and scoop for an in-flight auxiliary power unit, the scoop being adapted to open and start operation at altitude and on the ground, comprising:

an inlet opening contoured along its outer edges to conform to the aircraft fuselage,

a ramp trailing inwardly into the opening starting from the fuselage and forming the bottom surface of the inlet;

the inlet opening having generally parallel side walls trailing inwardly along opposite edges of the ramp;

the side walls extending inwardly from the fuselage edges along the inlet opening;

a scoop hingedly engaged to said aircraft adjacent said fuselage and adjacent one end of said inlet opening; and

means in said aircraft to operate said scoop from positions in which said scoop opens and closes said inlet opening;

said scoop having a closing wall with respect to said inlet opening, said closing wall closing said opening in the closed position and being contoured to conform with the fuselage surface in the closed position;

said closing wall being continuous in the open and closed positions and generally limited to the extent of said inlet opening;

said scoop being externally of said aircraft in the closed position;

said scoop having a cross section complementary to said inlet to fit therein in the open position;

said scoop having a passage therethrough to permit inlet air to move therethrough from outside the fuselage into the inlet.

4,418,880

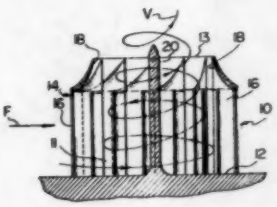
FLUID FLOW AUGMENTOR

J. F. de Waal, 4 Nicol St., Ottawa, Ontario, Canada K1J 8A5

Filed Nov. 27, 1981, Ser. No. 325,118

Int. Cl.³ B64C *23/06;* **B63H** *13/00*

U.S. Cl. 244—199 **24 Claims**



1. A fluid flow concentrating device comprising a substantially hollow body substantially closed at one end and open at the other, an axially extending vortex stabilizing column arranged substantially centrally of the hollow body, the body having a fixed circumferential wall means composed of a plurality of fixed spaced vanes and a nozzle located at the open end of said wall means, whereby fluid moving from outside the device substantially radially through said vanes to the inside of said body, creates a vortex within said hollow body and a fluid flow axially of said body through said nozzle.

4,418,881

RUDDER CONTROL GUST LOCK

Clarence C. Bouldin, Orange, N.J., assignor to C. C. Bouldin Inc., Paterson, N.J.

Filed Jul. 27, 1981, Ser. No. 287,392

Int. Cl.³ B64C *13/14;* **B64F** *1/00*

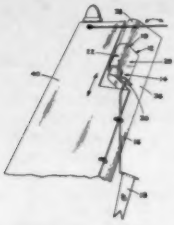
U.S. Cl. 244—224 **9 Claims**

1. A device for releasably securing the rudder and the vertical stabilizer of an airplane to each other, comprising:

(a) a partial collet having a generally U-shaped cross section with an inner surface adapted for wraparound reception of the forward most vertical leading edge of said rudder, said collet adapted to slidably seat on said forward most vertical leading edge and to slide in the vertical direction therealong; and

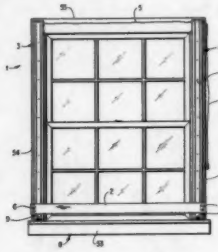
(b) paired, opposed flanges extending from said partial collet, in a direction generally transverse to the plane of said U-shaped cross section, said flanges adapted to slidably engage the broad surfaces of said stabilizer adjacent said

forwardmost vertical leading edge, upon sliding of said partial collet in the vertical direction, to maintain said



rudder and said stabilizer in planar stationary alignment when said airplane is not in use.

4,418,882
VARIABLE HEIGHT ROD SUPPORTER
Helen W. Waring, Rt. #2, Box 303, Mt. Pleasant, S.C. 29464
Filed Oct. 15, 1981, Ser. No. 311,554
Int. Cl.³ A47H *1/10*
U.S. Cl. 248—265 **9 Claims**



1. An apparatus for supporting a rod at varying heights horizontally along a pre-designated area of a structure comprising:

a. a first structure comprising a first roller track and a first pulley track secured onto one vertical side of said pre-designated area;

b. a second structure comprising a second roller track and a second pulley track secured onto the second vertical side of said pre-designed area;

c. a first guide roller guidable within said first roller track;

d. a second guide roller guidable within said second roller track;

e. a first support shaft around which said first guide roller is rotatably secured, with first guide roller securing means secured around said first support shaft on both sides of said first guide roller;

f. a second support shaft around which said second guide roller is rotatably secured, with second guide roller securing means secured around said second support shaft on both sides of said second guide roller;

g. a rod attachment bar rigidly secured to said first support shaft and said second support shaft to which a rod or a plurality of rods may be secured; and

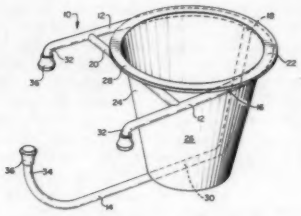
h. height adjustment means secured within said apparatus operative to raise or lower said rod attachment bar, whereby when said rod attachment bar is moved, said first guide roller is guided within said first roller track and said second guide roller is guided within said second roller track stabilizing said rod attachment bar during movement, said height adjustment means comprising:

(1) a first hoisting pulley rotatably secured around said first support shaft in said first pulley track, with first hoisting pulley securing means around said first support shaft on both sides of said first hoisting pulley;

(2) a second hoisting pulley rotatably secured around said second support shaft in said second pulley track, with second hoisting pulley securing means around said second support shaft on both sides of said second hoisting pulley; and

(3) hoisting means connected around said first hoisting pulley, and therefore around said first support shaft, and said second hoisting pulley, and therefore around said second support shaft, and extending above said pre-designated area, operative to raise or lower said rod attachment bar.

4,418,883
SELF-SUPPORTING, TABLE-MOUNTED, SUPPORT APPARATUS FOR RECEPTACLES
Daniel Cohen, 2515 Cummings Ave., Superior, Wis. 54880
Filed Oct. 14, 1981, Ser. No. 311,419
Int. Cl.³ A47K *1/08*
U.S. Cl. 248—312.1 **20 Claims**



1. Apparatus for supporting receptacles relative to a horizontally disposed table surface, comprising:

first support arm means, comprising a pair of laterally spaced arms and a cross-bar interconnecting said laterally spaced arms, disposed within a horizontal plane;

substantially J-shaped second support arm means, disposed within a vertical plane, integrally connected to said first support arm means at a location defined within said horizontal plane so as to form therewith a one-piece support arm framework;

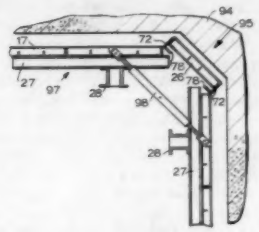
said first and second support arm means defining a horizontal channel therebetween within which said table surface is to be disposed and wherein said first and second support arm means engage the upper and under surfaces of said table, respectively; and

annular ring means operatively connected to said one-piece support arm framework for supporting a receptacle relative to said table surface.

4,418,884
DOUBLE-HINGE CORNER FOR A CONCRETE FORMING STRUCTURE
Vernon R. Schimmel, Lincolnwood, Ill., assignor to Symons Corporation, Des Plaines, Ill.
Filed May 13, 1982, Ser. No. 377,977
Int. Cl.³ E21D *10/00*
U.S. Cl. 249—11 **18 Claims**

15. An inside articulated and collapsible concrete form for forming a concrete wall structure having chamfered concrete corners, the form having spaced panel sections and a chamfered corner positioned in inclined relation between said spaced panel sections, and panel sections and said corner having forming faces and marginal frame edges, and means for releasably positioning and holding said panel sections and said corner in predetermined positions to facilitate the pouring of concrete, and a pair of double hinge corner assemblies defining a total of four pivot points and being secured with opposite

ends of said chamfered corner, and the double hinge corner assemblies also each being secured to an associated one of said panel sections, the panel sections being bodily movable with



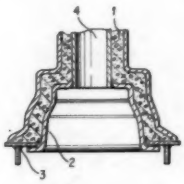
respect to the chamfered corners on the double hinge corner assemblies to effect release of the concrete form from the formed concrete wall structure.

4,418,885

NOZZLE HOOD FOR MOULDING PIPES

Angel B. Serrano, c/o Encomienda de Placios No. 183, Madrid, Spain

Filed Nov. 24, 1981, Ser. No. 324,596
Claims priority, application Spain, Nov. 24, 1980, 254.608
Int. Cl.³ B28B *21/04*
U.S. Cl. 249—100 **2 Claims**



1. Apparatus for moulding pipes having a flared nozzle comprising:

a hood of generally convex shape having an outer surface corresponding to the shape of the interior of a pipe to be moulded, said hood including an annular rim on the periphery of the widest part thereof;

a moulding shank rigidly attached to the narrowest part of said hood and extending within the hollow interior of said pipe; and

a flat annular washer supported on said annular rim and separable therefrom said hood being removable from said moulded pipe said washer remaining to form a flat terminal end for said pipe.

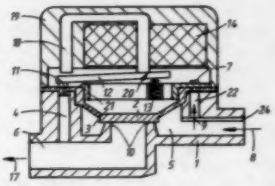
4,418,886

ELECTRO-MAGNETIC VALVES PARTICULARLY FOR HOUSEHOLD APPLIANCES

Walter Holzer, Drosteweg 19, 7758 Meersburg, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,714
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108693
Int. Cl.³ F16K *31/02*
U.S. Cl. 251—30 **10 Claims**

1. An electro-magnetic valve having hydraulic control consisting of a valve body having an inlet and an outlet, a valve seat sealable by a flexible diaphragm, in which both the inlet and the outlet are arranged on a first side of the diaphragm, a hydraulic pressure chamber on a second side of the diaphragm, a filling aperture from the inlet to the pressure chamber and a pressure-relief aperture from the pressure chamber to the outlet, an armature which, when unenergized, closes the pressure-relief aperture under spring pressure, wherein the improvement comprises said hinged armature being positioned entirely within the pressure chamber and said pressure-relief aperture



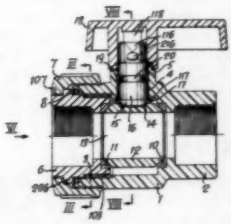
being opened when said armature is energized; a valve seat of said pressure-relief aperture being a non-flexible part of said diaphragm; and a by-pass in the valve body connecting the pressure-relief aperture and the pressure chamber to the outlet, and said valve seat of said pressure relief aperture being juxtapositioned to said bypass.

4,418,887

PLUG VALVE

Bruno Tubaro, 76/2, Via Solimano, Sori(Genova), Italy

Filed Oct. 26, 1981, Ser. No. 315,023
Claims priority, application Italy, Oct. 31, 1980, 15244 B/80[U]
Int. Cl.³ F16K *51/00*
U.S. Cl. 251—152 **3 Claims**



1. A plug valve made of plastics material, particularly adapted for water ducts, irrigation systems and the like, comprising:

a valve body (1) having two tubular coaxial extensions (2, 3);

a spherical plug (12) housed in said valve body (1) between said two tubular extensions (2, 3) and having a diametral through bore (13) and a groove (14) on the periphery thereof extending transversely to said dimetral through bore (13), said spherical plug (12) being rotatable in said valve body around an axis which is perpendicular to the common axis of said two coaxial tubular extensions (2, 3);

said valve body having a transverse bore (4) through one side thereof with an inner outlet between said two tubular extensions (2, 3), the transverse bore having an axis that is coaxial with said perpendicular axis of said spherical plug (12);

a control stem (16) rotatably mounted in said transverse bore (4), seal means (19, 20) connected between said control stem and said transverse bore (4), a radial rib (15) projecting from the inner end of said control stem (16) and engaged in said groove (14) on the periphery of said spherical plug to operatively couple said control stem (16) to said spherical plug (12), a flat abutment and sliding surface

(117) formed in the valve body (1) surrounding the inner outlet of the transverse bore (4), an annular flange (17) integral with the said inner end of said control stem (16) positioned adjacent to and cooperating with said flat abutment and sliding surface (117);

at least one connector sleeve (6) axially slidably inserted into the interior of one of the said two tubular extensions (2,3) of the valve body (1), a coaxial annular packing (11) on the inner end of said connector sleeve (6) adapted to be compressed in a tight manner against said spherical plug (12);

an annular peripheral exterior projection (206) on said connector sleeve (6), a conical flaring enlargement (9) on the mouth of said one of the said two tubular extensions (3) of the valve body, an annular packing (8) adapted to be compressed into said conical flaring enlargement (9) by said annular projection (206);

a plurality of longitudinal cogs (103) on the inner wall of said one of said two tubular extensions (3), plural external longitudinal mating cogs (106) on said connector sleeve (6) adapted to engage with said plurality of longitudinal cogs (103) on said one of said two tubular extensions (3);

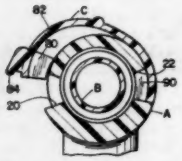
a locking ring nut (7), external threading on the said one of said two tubular extensions (3) onto which said locking ring nut (7) is screwed, said locking ring nut (7) being superimposed over said connector sleeve (6) so as to cover and surround the said peripheral exterior annular projection (206) on said connector sleeve (6), said locking ring nut (7) having an inner projection portion (107), said locking ring nut (7) adapted to be screwed onto said one of said two tubular extensions (3) to such an extent that the inner projection portion (107) axially moves into substantially flush contact with said annular projection (206) of said connector sleeve (6) causing said annular projection (206) to compress said annular packing (8), a small annular radial clearance being provided between the said connector sleeve (6) and the said ring nut (7) whereby said ring nut can be easily superimposingly fitted onto said connector sleeve (6) and screwed onto the said external threading on said tubular extension (3) of the valve body (1), whereby when said connector sleeve (6) is subjected to radial expansion it abuts against said ring nut.

4,418,888

ANGLE COCK VALVE

Irvin D. Jacobson, Bratenahl; Frank R. Volgstadt, Madison, and David P. Passerell, Geneva, all of Ohio, assignors to Perfection Corporation, Madison, Ohio

Filed Jun. 8, 1981, Ser. No. 271,281
Int. Cl.³ F16K *31/44*
U.S. Cl. 251—216 **16 Claims**



1. A drain valve comprising:

a valve body having an externally threaded first end which is adapted to be threadingly received in a female fitting, a second end opposite the first end, a linear bore extending linearly through the valve body from the first end to the second end, an annular seat disposed in said linear bore mediate the first and second ends, an internally threaded portion disposed in said linear bore mediate the annular seat and the second end, a smooth, cylindrical portion in said linear bore mediate the annular seat and the second end, and an outlet spout having an internal outlet bore which is connected with said linear bore;

a valve stem having an enlarged handle portion and a cylindrical section dimensioned to be received in said linear bore from the second end, a seat seal mounting means disposed on the cylindrical section for mounting a seat seal, an externally threaded portion on the cylindrical section for engaging the internally threaded portion of said linear bore such that rotation of the valve stem relative to the valve body moves the seat seat in and out of fluid flow sealing engagement with said annular seat, and an annular seal for engaging the cylindrical section of said valve stem and said cylindrical portion of said linear bore in a fluid sealing relationship; and

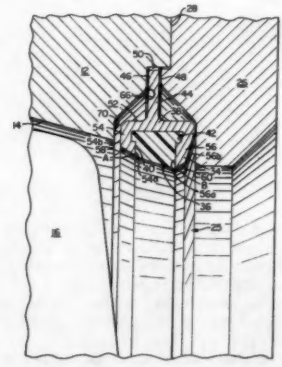
a stem retainer received on the valve body for releasably retaining the stem in said linear bore, said stem retainer including a projection adapted to extend through an aperture in the valve body and biasing means for resiliently biasing the projection into said valve body aperture, said projection being adapted to cooperate with an adjacent portion of the valve body when the projection is removed from the aperture for maintaining the stem retainer in a stable disabled condition while the stem retainer remains associated with the valve body.

4,418,889

FIRE SAFE SEAT FOR A VALVE

Bernd Krause, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Mar. 16, 1981, Ser. No. 244,091
Int. Cl.³ F16K *1/22*
U.S. Cl. 251—306 **22 Claims**



1. A fire-safe valve, comprising:

(a) a valve body having a bore therethrough;

(b) a valve closure member mounted in said bore and movable between open and closed positions about an axis substantially transverse to said bore, said closure member having a peripheral sealing surface;

(c) an annular recess circumscribing said bore and disposed in radial alignment with said peripheral sealing surface of said closure member when said closure member is in the closed position;

(d) a seat member adapted to selectively interface with said sealing surfaces of said closure member supported in said annular recess and extending radially inward therefrom, said seat member including:

(i) an annular metal flange secured to said valve body and extending radially inward into said bore, said flange being pliant in at least one axial direction;

(ii) a metal seat ring extending radially inward from said metal flange having an axial dimension which is sub-

stantially greater than the corresponding axial dimension of said metal flange, said metal seat ring having radially extending axial sidewalls which at least partially define an annular flanged groove within said seat ring, the radial end surfaces of said groove defining sidewalls being axially converged toward the groove; and

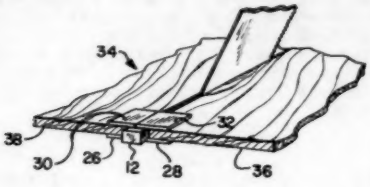
(e) an annular sealing surface formed of material softer than the metal of the metal seat ring snugly fitted within said annular flanged groove, said sealing surface of softer material extending radially beyond the radial extension of the metal seat ring and being resiliently radially deformable to a position corresponding to the radial extension of the axial sidewalls of said metal seat ring under the influence of an interface force with the closure member.

4,418,890

WEDGE WITH FLANGES

Alan Knight, 1349 Hanover Ct., Circleville, Ohio 43113

Filed Oct. 16, 1981, Ser. No. 311,859
Int. Cl.³ B66F *11/00*
U.S. Cl. 254—104 **12 Claims**



1. A flanged wedge having a wedge body with two converging flat sides, two parallel planar surfaces, a blunt end, and a chisel end, said blunt end of said wedge body being of relatively greater thickness between said two converging flat sides than the opposite chisel end thereof which is relatively narrowed, wherein the improvement comprises:

at least two non-cutting, support flanges, a first one of said flanges extending transversely of the longitudinal axis of the wedge body and away from the first of said converging sides at or near the first of said parallel planar surfaces and a second one of said flanges extending transversely of the longitudinal axis of the wedge body in a direction opposite said first one of said flanges and away from the second of said converging sides at or near the second of said planar surfaces, each said flange at the leading edge extending away from said longitudinal axis of the wedge body a distance which is greater than one-half the thickness of said wedge body at said blunt end.

4,418,891

DEVICE FOR TENSIONING CHAINS

Elis Kallaes, and Karl-Erik Starell, both of Orsa, Sweden, assignors to Orsa Kattingfabrik AB, Stockholm, Sweden

Continuation of Ser. No. 207,659, Nov. 17, 1980, abandoned. This application Dec. 14, 1982, Ser. No. 449,625
Claims priority, application Sweden, Nov. 23, 1979, 7909717; Sep. 11, 1980, 8006371
Int. Cl.³ B21F *9/00*
U.S. Cl. 254—260 **13 Claims**

1. A device for tensioning chains comprising a shank having a body and opposite first and second integral end portions, the first end portion being flattened for receiving a link of a first chain and a link of a second chain, the first end portion having a free end and opposite first and second narrow edges, at least the first narrow edge being substantially straight along its length and extending substantially parallel with the body from the tip of the free end to the point where the flattened end portion joins the body of the shank;

a first recess on the first edge near the free end for engaging a link of the first chain;

a second recess on the second edge and laterally spaced from the first recess toward the body for receiving a link of the second chain;

a locking chain swivelably attached around the second end portion and including a hook for fastening the locking chain to either the first chain or the second chain to mutually tension the first and second chains;

a take-up chain having a first link swivelably attached around without passing through the shank between the second recess and the body and including a hook for removably fastening into a link of the first chain to permit movement of the first recess into a different link of the first chain for adjusting the device while maintaining mutual tension between the first and second chains; and

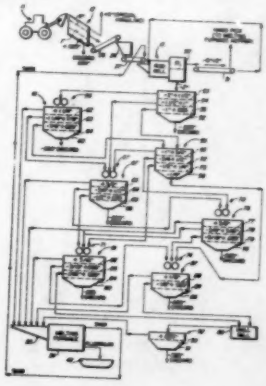
material projections on the shank between the second recess and the body for limiting lateral movement of the first link of the take-up chain along the shank between the body and such material projections thereby to prevent the take-up chain from engaging the second recess.

4,418,892

ALUMINUM FURNACE SKIM RECOVERY SYSTEM

Frank H. Howell, 150 S. Detroit St., Los Angeles, Calif. 90036

Filed May 10, 1982, Ser. No. 376,665
Int. Cl.³ F27B *14/02*
U.S. Cl. 266—137 **5 Claims**



1. A reclaiming system for recovering aluminum from skim material of an aluminum furnace comprising:

first, second and third screening means,

said first screening means comprising two vertically positioned screens with the first screen positioned to receive the skim material and retaining on its surface a first size fraction of the material for movement into an aluminum

furnace and passing therethrough and onto the second screen a first remainder of the material, said second screen retaining on its surface a second size fraction of the material for movement into a rod mill and passing therethrough a second, aluminum poor remainder of the material which is discarded,

a rod mill,

said rod mill discharging the second size fraction of the material received into said second screening means,

said second screening means comprising third and fourth vertically positioned screens with the third screen positioned for receiving said second size fraction and retaining on its surface a third size fraction and passing therethrough onto said fourth screen a third remainder, said third size fraction being moved back into said rod mill for further elongation, flattening and widening of aluminum particles forming a part thereof, said fourth screen retaining on its surface a fourth size fraction and passing through a fourth, aluminum poor remainder of the material which is discarded, said fourth size fraction being conveyed into a crushing means,

a crushing means,

said crushing means discharging said fourth fraction into said third screening means,

said third screening means comprising a fifth screen for receiving thereon said fourth size fraction received from said crushing means, said fifth screen retaining thereon a fifth size fraction and passing therethrough a fourth remainder which is aluminum poor and is discarded,

a hopper and an associated processing furnace,

said fifth size fraction being moved into said hopper,

said hopper discharging said fifth size fraction into said processing furnace,

said processing furnace discharging a fifth remainder which is aluminum rich, and

means for receiving said fifth remainder for converting it into molten aluminum.

4,418,893

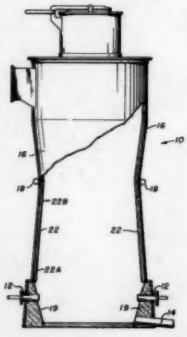
WATER-COOLED REFRACTORY LINED FURNACES

John A. Middleton, Eagleville, and Thomas L. O'Dwyer, Berwyn, both of Pa., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 16, 1981, Ser. No. 331,040

Int. Cl.³ C21B *7/06, 7/10;* C21D *1/00*

U.S. Cl. 266—192 **3 Claims**



1. In a water cooled furnace including a metal furnace shell and means for water cooling the exterior surface of said shell, the improvement comprising a relatively uniformly thick lining of prefired refractory blocks lining the interior surface of said shell and means mechanically attaching said refractory blocks to said shell wherein said refractory blocks have a thermal conductivity of between 15 and 100 BTU/sq.ft./hr./in./°F. and a thickness of about three inches such that a significant portion of the thickness of said refractory blocks will remain when equilibrium conditions have been reached and said refractory lining will maintain its mechanical integrity.

3. In a water cooled cupola including a metal shell and means for water cooling the exterior surface of said metal shell wherein said cupola has at least one high temperature region and at least one low temperature region vertically spaced in said cupola, the improvement comprising a relatively uniformly thick lining of prefired refractory blocks lining the interior surface of said metal shell and means mechanically attaching said refractory blocks to said shell, said refractory blocks comprising:

a. a first set of refractory blocks in the high temperature region having a thermal conductivity between 15 and 100 BTU/sq.ft./hr./in./°F. such that the interior surface of said first set of refractory blocks will be maintained at about a preselected temperature; and

b. a second set of refractory blocks in the lower temperature region having thermal conductivity lower than that of said first said set of refractory blocks and between 0.4 and 20 BTU/sq.ft./hr./in./°F. such that heat conductivity through said second set of refractory blocks will be lower than through said first set of refractory blocks and such that the interior surface of said second set of refractory blocks will not exceed said preselected temperature;

whereby a significant portion of the thickness of said refractory blocks will remain when equilibrium conditions have been reached and said refractory blocks will maintain their mechanical integrity.

4,418,894

FURNACE TAPHOLE DRILLING APPARATUS AND METHOD

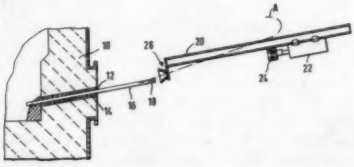
Pierre Mailliet, Howald, Luxembourg, assignor to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Nov. 3, 1981, Ser. No. 317,767

Claims priority, application Luxembourg, Nov. 17, 1980, 82943

Int. Cl.³ C21B *7/12*

U.S. Cl. 266—271 **6 Claims**



1. A support device affixed to the leading end of a movable support bar along which a percussive taphole drill moves, said support device locating the end of a drill rod which is inserted through a hardened clay plug of a taphole and positioning the end of the drill rod so that it can be received and gripped by a coupling device of the percussive taphole drill, said support device comprising:

guide member means, said guide member means having an alignment portion which is dimensioned so as to allow passage of said drill rod therethrough, said alignment portion aligning the end of said drill rod with the coupling device of said percussive taphole drill, said guide member means further including a locating and adjusting portion, said locating and adjusting portion engaging the end of said drill rod and guiding it to said alignment portion;

said locating and adjusting portion being a partial hollow frustoconical shaped member having its narrow end juxtapositioned and aligned with said alignment means, said frustoconical shaped member further being provided with an open lateral groove extending out from said alignment portion; and ..

means for mounting sid guide member to the leading end of the movable support bar.

4,418,895

ELASTIC SUPPORTS, NOTABLY FOR VEHICLE ENGINE SUSPENSION

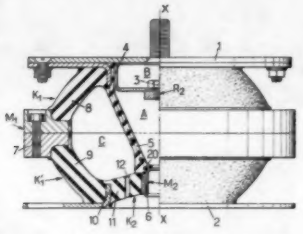
Jacques Bertin, Asnieres; Michel Pompei, Paris, and Jean-Pierre Valjent, Ris-Orengis, all of France, assignors to Hutchinson-Mapa, France

Continuation of Ser. No. 70,113, Aug. 27, 1979, abandoned. This application Sep. 28, 1981, Ser. No. 306,522

Claims priority, application France, Sep. 6, 1978, 78 25681

Int. Cl.³ F16M *5/00;* **F16F** *15/00*

U.S. Cl. 267—140.1 **12 Claims**



1. A damped elastic support, for insertion between two bases to be supported on one another, comprising:

a damper device formed by first and second chambers connected by a restriction means for providing restricted flow therebetween, one of said first and second chambers comprising a rigid member affixed to one of said bases,

a first spring means formed at least partially of elastomer, and being arranged in a path in series with the damper device between said bases so as to form a damper device-first spring means assembly,

a second spring means arranged between said bases in a path in parallel with the path containing the damper device and first spring means, said second spring means comprising an annular shaped elastomer member which totally surrounds the assembly formed by said damper device and said first spring means and defining with said assembly, between said bases, a third chamber which is independent of said first and second chambers,

at least one of the first and second chambers being bounded by a flexible wall having a shape of revolution such that deformation of said flexible wall, due to deformation of the said first and second spring means, causes a damper fluid to flow between the first and second chambers through the restriction means, said flexible wall being directly joined to the abovementioned rigid member and to a further rigid member and said first spring means joining said further rigid member to the other of said bases.

4,418,896

APPARATUS FOR CONTROLLING THE FRICTION BETWEEN THE LEAF SPRINGS OF A LAMINATED LEAF SPRING ASSEMBLY

Takeyoshi Shinbori, Yokosuka, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jul. 30, 1982, Ser. No. 403,868

Claims priority, application Japan, Aug. 10, 1981, 56-125125

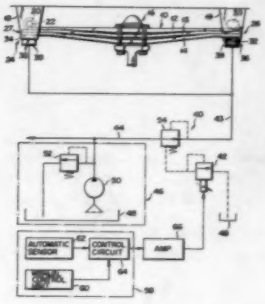
Int. Cl.³ B60G *11/02;* **F16F** *1/18*

U.S. Cl. 267—36 R **3 Claims**

1. An apparatus for controlling the friction between leaf springs of a laminated leaf spring assembly, comprising:

clamping means mounted on the laminated leaf spring assembly which is attached at both ends to a body, thus supporting the body, for clamping the laminated leaf spring assembly, said clamping means including a guide member and a press member which clamp the laminated leaf spring assembly;

hydraulic cylinder means for pressing said press member to thereby urge said laminated leaf spring assembly against said guide member, said hydraulic cylinder means including a cylinder and a piston which is movable in the cylinder and one end of which is connected to said press member;



hydraulic control means including a pressure reducing valve and a control valve for controlling the pilot pressure of said pressure reducing valve; and

detecting means for detecting the values of the predetermined factors of the body and supplying signals representing the values detected to said control valve so as to control the pilot pressure of said pressure reducing valve.

4,418,897

TWO-CHAMBER MOTOR MOUNT WITH HYDRAULIC DAMPING

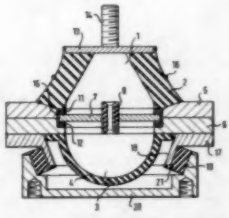
Volker Härtel, Vallendar, and Manfred Hofmann, Hünfelden, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 17, 1981, Ser. No. 244,652

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027742

Int. Cl.³ F16F *9/10, 15/04*

U.S. Cl. 267—140.1 **8 Claims**



1. Two-chamber motor mount with hydraulic damping, especially for motor vehicles, comprising an upper and a lower chamber having rubber-elastic walls and being filled with liquid, said upper chamber being of hollow conical construction, a bolding flange disposed between said walls of said upper and lower chambers, an intermediate plate with a throttle orifice located in vicinity of and sealingly secured at the outer edge thereof to said holding flange, said throttle orifice being defined by a tube-shaped rubber insert extending substantially perpendicularly through said intermediate plate and having a substantially oval inner cross section said upper and said lower

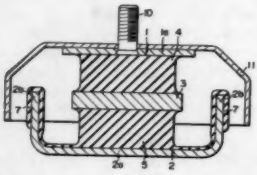
chambers being connected to one another through said intermediate plate solely via said throttle orifice for preventing an hydraulic response for high frequency vibrations of small amplitude, said intermediate plate being responsive to high frequency vibrations of small amplitude for closing said throttle orifice at high pressures.

4,418,898

CUSHIONED MOUNTING DEVICE WITH A MASS MEMBER FORMING A SUB-OSCILLATION SYSTEM AND MEANS FOR RESTRICTING CUSHIONING MOVEMENT

Tomiaki Atsumi; Kazumasa Kuse, and Junji Deto, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 9, 1981, Ser. No. 281,779
Int. Cl.³ B60G *11/22*; F16F *1/36*
U.S. Cl. 267—63 R **4 Claims**



1. A cushioned mounting device, comprising:

a first frame member of an inversed bowl-like shape including a central flat portion and an annular side wall portion extending outwardly from said central flat portion thereabout;

a second frame member of a substantially U-shaped cross section including a middle flat portion and two flange portions extending outwardly from opposite ends of said middle flat portion;

a flat plate mass member; and

a first and a second flat cushion member;

said first frame member, said second frame member, said flat plate mass member, said first cushion member and said second cushion member being so assembled together that said central flat portion of said first frame member and said middle flat portion of said second frame member are opposed to one another with interposition of a piled up assembly of said flat plate mass member and said first and second cushion members with said flat plate mass member being sandwiched between and bonded on opposite sides thereof with said first cushion member and said second cushion member, while said first and second cushion members are bonded with said central flat portion of said first frame member and said middle flat portion of said second frame member, respectively,

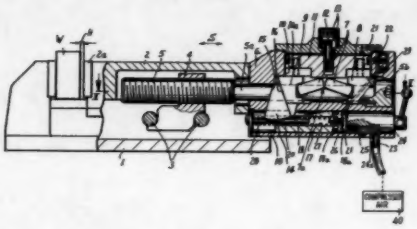
wherein said two flange portions of said second frame member are housed within said annular side wall portion of said first frame member so that each of said two flange portions of said second frame member opposes each adjacent inside surface portion of said annular side wall portion of said first frame member with each predetermined clearance left therebetween.

4,418,899

PNEUMATICALLY DRIVEN CLAMPING DEVICE, IN PARTICULAR A MACHINE VICE

Hanns Zimmermann, Memmingen, and Peter Preisenhammer, Kempten, both of Fed. Rep. of Germany, assignors to Saurer-Allma GmbH, Kempten, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,283
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1980, 8028201
Int. Cl.³ B25B *1/14*
U.S. Cl. 269—32 **14 Claims**



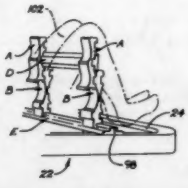
1. A fluid actuated clamping device, comprising a base, a clamping member supported for movement relative to said base in a first direction and having a first surface thereon, an element supported for movement in said first direction independently of said base and clamping member and having a second surface thereon, a wedge supported for movement in a second direction transverse to said first direction and having third and fourth surfaces thereon which converge substantially in said second direction and which respectively slidably engage said first and second surfaces, first fluid actuated means for effecting movement of said wedge in said second direction, power amplifier means cooperable with said base and said element for causing movement of said element relative to said base in said first direction, second fluid actuated means for actuating said power amplifier means, means for selectively supplying a pressurized fluid to said first fluid actuated means, means defining a connecting duct for supplying said pressurized fluid from said first fluid actuated means to said second fluid actuated means, and excess pressure valve means disposed in said connecting duct for obstructing fluid flow therethrough until said pressurized fluid supplied to said first fluid actuated means exceeds a predetermined value.

4,418,900

CORPSE POSITIONING SYSTEM

Theodore D. Ricke, 710 E. 4th, Hoisington, Kans. 67544

Filed Mar. 3, 1981, Ser. No. 240,217
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—45 **4 Claims**



1. A corpse positioning system including:

a pair of first blocks, identical in configuration;

said pair of first blocks each being in the form of a polygonal body having spaced, identical areas on one surface thereof

and grooves in the surface thereof opposite to said indented areas;

a pair of second blocks, identical in configuration;

a pair of third blocks, identical in configuration;

an embalming table for supporting the corpse in a generally prone position; and

means on the blocks for interlocking the first, second and third blocks in various arrangements to support and retain the corpse in the proper position on the embalming table for embalming purposes.

4,418,901

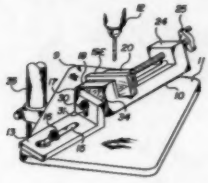
VISE SYSTEM

William D. Woods, and John H. Pigman, both of Phoenix, Ariz., assignors to International Design Corporation, Phoenix, Ariz.

Filed Apr. 22, 1981, Ser. No. 256,258

Int. Cl.³ B23Q *1/04*

U.S. Cl. 269—71 **11 Claims**



1. A clamping device to be used in connection with a flat work surface, including in combination:

a. an L-shaped bracket section having an end piece with a flat end surface oriented perpendicular to the work surface when the base of the bracket section is resting thereon;

b. means for attaching the base of the bracket section to the work surface in a manner to allow the position of the bracket section to be rotatably adjustable in the plane of, and rigidly tightenable against, the work surface;

c. a vise section for adjustably holding a work piece, comprising:

i. a mating surface oriented perpendicular to the work surface when the vise section is resting thereon;

ii. a pair of jaw members mounted for relative movement toward and away from one another for clamping a work piece therebetween;

iii. at least first, second, and third flat surfaces on the vise section each perpendicular to the mating surface for abutment against the flat work surface, said first and third surfaces being parallel to one another and perpendicular to said second surface;

iv. a pair of parallel spaced apart way members having coplanar jaw slide surfaces thereon parallel to the second flat surface on the vise section, wherein the relative movement of the jaws is upon the coplanar jaw slide surfaces, which jaw slide surfaces extend between the jaws and constitute a flat reference surface for receiving a flat surface of a work piece; and

d. means for releasably connecting the vise section to the end piece of the bracket section on the side opposite the base thereof, so that the matir.g surface of the vise section contacts the flat end surface of the end piece of the bracket section and the vise section is rotatably adjustable in the plane of the flat end surface of the bracket section and is rigidly tightenable against the bracket section in various rotational positions to cause different ones of said first, second, and third surfaces of said vise section to abut the flat work surface to thereby accurately index work pieces clamped between the jaw members to the flat work surface.

4,418,902

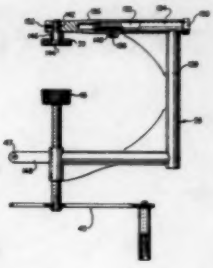
ADJUSTABLE PORTABLE SAW GUIDE DEVICE

Charles A. Genge, 108 Regent St., Apt. 6, Kingston, Ontario, Canada K7L 4J8

Division of Ser. No. 158,282, Jun. 10, 1980, Pat. No. 4,307,513. This application Dec. 10, 1981, Ser. No. 329,583

Int. Cl.³ B25B *1/10*

U.S. Cl. 269—258 **3 Claims**



1. A clamp for use with a power saw guide assembly, which assembly is adapted to rest upon a generally flat work piece which includes an elongate trackway on an upper side thereof, said clamp being generally C-shape and having speed elongate arms extending outwardly from an arm-connecting member, one of said arms having thereon clamp screw means with a work-engaging end portion disposed toward the other arm,

a trackway-engaging member on an outer end portion of said other arm, said trackway-engaging member extending from an outer end portion of other arm in a direction transverse to the lengthwise axis thereof,

and means for angularly adjusting said outer end portion of the other arm about the lengthwise axis of said other arm.

4,418,903

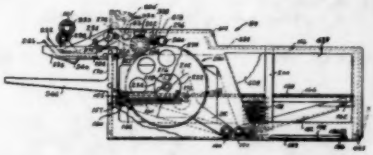
LARGE CAPACITY COMBINATION MAGAZINE AND SHEET FEEDER FOR COPYING MACHINES

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Continuation of Ser. No. 110,924, Jan. 10, 1980, abandoned, which is a division of Ser. No. 898,139, Apr. 20, 1978, abandoned, which is a continuation of Ser. No. 269,774, Jun. 3, 1981, Pat. No. 4,362,297. This application Dec. 31, 1981, Ser. No. 336,033

Int. Cl.³ B65H *5/00*

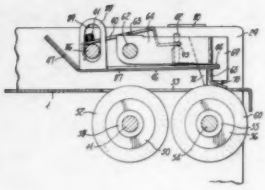
U.S. Cl. 271—10 **3 Claims**



1. In a magazine and automatic sheet feeder for successively delivering sheets from a delivery end of said magazine in which the improvement comprises biasing means for raising said stack with its top sheets adjacent said discharge end, a one-way clutch brake for restraining said stack against upward movement when the top sheets are at a predetermined location adjacent to said discharge end, a feed foller, means mounting said feed roller on said magazine for swinging movement into engagement with the top sheet, means responsive to movement

of said roller after a sheet is fed from said magazine for releasing said brake, an inertial damper, and a one-way clutch coupling said inertial damper to said stack to limit the rate of upward movement of said stack.

4,418,904
SHEET FEEDING APPARATUS
Sakae Fujimoto, Chofu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Aug. 26, 1980, Ser. No. 181,631
Claims priority, application Japan, Aug. 27, 1979, 54-108873
Int. Cl.³ B65H *3/06, 3/52, 3/54*
U.S. Cl. 271—37 **31 Claims**



1. An apparatus for individually feeding a plurality of sheets, comprising:

a tray for receiving a stack of sheets thereon;

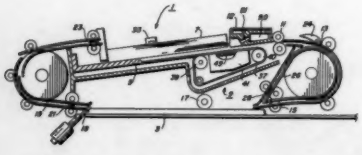
means including at least one sheet separation roller having a portion of its peripheral surface extending upwardly through said tray and a brake member urged against the peripheral surface of said sheet separation roller for feeding sheets individually from beneath said brake member;

means including at least one sheet feed roller located upstream from said sheet separation roller and having a peripheral surface extending upwardly through said tray for feeding sheets stacked on said tray to said sheet separating roller;

means including a pressure plate movable into a first position pressing sheets stacked on said tray against said sheet feed roller for feeding said sheets toward said sheet separation roller and thereafter into a second position away from said sheet feed roller for releasing said sheets from pressure contact with said sheet feed roller; and

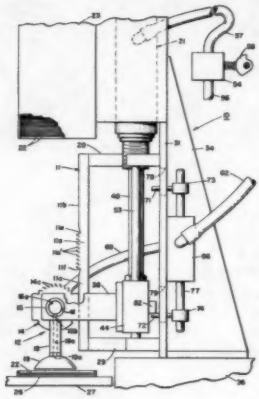
drive means associated with said pressure plate for moving said pressure plate into its second position during the period of time the leading edge of a sheet between said sheet separation roller and said brake member.

4,418,905
SHEET FEEDING APPARATUS
Gerald M. Garavuso, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 2, 1981, Ser. No. 317,219
Int. Cl.³ B65H *3/14*
U.S. Cl. 271—98 **20 Claims**



1. A sheet feeding apparatus for feeding sheets from a stack of sheets comprising a sheet stack supporting tray, means to feed a sheet from a stack of sheets, and air injection means disposed adjacent an edge of said tray to inject air between the sheet in the stack to be separated and the remainder of the stack, said air injection means including means to inject a substantially planar stream of air between the sheet to be separated and the remainder of the stack, said planar stream of air having portions at its sides which converge toward the center of the planar air stream thereby providing both convergence in the planar stream and expansion in a direction perpendicular to that of the air stream to facilitate separation of the sheet to be separated from the remainder of the stack.

4,418,906
SHEET STOCK TRANSFER APPARATUS
Richard H. Scott, Columbus, Ohio, assignor to Western Electric Company, Inc., New York, N.Y.
Filed Oct. 28, 1981, Ser. No. 315,805
Int. Cl.³ B65H *3/08*
U.S. Cl. 271—99 **15 Claims**



1. An apparatus for transferring piece parts from a dispensing station to a receiving station, said apparatus comprising:

means for releasably grasping a lowermost one of a stack of piece-parts when positioned at a dispensing station, and for positioning and releasing each such grasped piece-part at a receiving station, after having been transferred thereto;

means, connected to said grasping means, for reciprocally driving said grasping means sequentially along separate discontinuous linear paths of predetermined lengths while said grasping means approaches, arrives at, and is withdrawn from said dispensing and receiving stations, respectively, and for rotating said grasping means, and a piece-part when grasped thereby, along an arcuate path defined by a predetermined number of degrees of rotation while being transferred alternately from one of said linear paths to the other thereof;

said separate linear paths defined by said drive means, and along which said grasping means is sequentially driven, are co-linear, and separated by said arcuate transfer path, and wherein said rotation imparted to said grasping means by said drive means encompasses an arc of 180 degrees, thus effecting the complete inversion of a piece-part when transferred from said dispensing station to said receiving station by said releasable grasping means; and

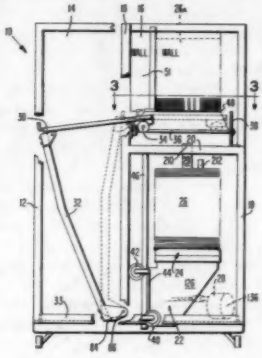
said drive means includes a specially constructed rack and pinion, each of the latter two elements being formed with specially contoured transition regions that selectively cooperate to impart linear-to compound linear and rotational-to linear displacement to said pinion and, in turn, to said connected piece-part grasping means, when the latter is driven from said dispensing station to said receiving station, and vice versa, by said drive means.

4,418,907

AUTOMATIC RELOADER-ELEVATOR FOR CUT SHEET PRINTING APPARATUS

Richard E. Shultz, Maitland, and William E. Voecks, Jr., Winter Park, both of Fla., assignors to Burroughs Corporation, Orlando, Fla.

Filed Sep. 16, 1981, Ser. No. 302,953
Int. Cl.³ B65H *1/26, 1/14*
U.S. Cl. 271—157 **7 Claims**



1. Modular automatic reloader-elevator for cut sheet printing/copying apparatus wherein individual sheets of paper are fed from a stack to a feeding device and wherein fresh sheets are automatically reloaded momentarily interrupting the operation of the apparatus, comprising,

a main item feeding tray centrally, vertically, cantilever mounted for movement relative to a base support member,

drive means for raising and lowering said feeding tray on demand along a vertical guide relative to said base support member;

means for sensing when said tray is exhausted of paper items;

an item reloader tray arcuately, pivotally mounted so as to be movable normal to and into and out of the path of movement of said main item tray;

means for temporarily locking said item reloader tray in position in the path of movement of said main item tray so that said main item tray can engage said reloader tray for loading of items therefrom, and

means responsive to said sensing means for energizing said drive means effectively raising said main item tray into engagement with said reloader tray thereby unlocking said reloader tray and causing the paper items on said paper reloader tray to seat upon said main item tray simultaneously moving said reloader tray out of the path of movement of said main item tray enabling the item feeding to resume.

4,418,908

ACTION GAME

Benjamin Kinberg, 425 Riverside Dr., New York, N.Y. 10025

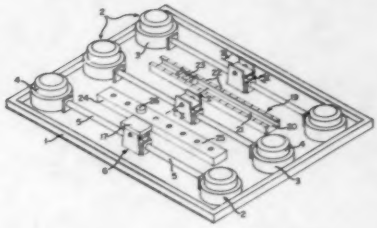
Filed May 13, 1982, Ser. No. 377,709
Int. Cl.³ A63F *7/00, 7/24, 7/30*
U.S. Cl. 273—1 GE **10 Claims**

1. An action game for two or more players, comprising

a base;

at least one set composed of at least two cooperating player stations on said base, each of said stations including a gas-containing elastically deformable volume-changing receptacle, a tube sealingly connected with the receptacle and having an open end, and a plunger fluid-tightly received in and reciprocable lengthwise of the tube, the tubes of said stations being axially aligned with one another and the open ends thereof being somewhat spaced from each other;

at least one perch, including an element which is rockable about a pivot normal to the elongation of said tubes and including a normally horizontal cross-member and an upright member depending therefrom and located intermediate said open ends so that an impact upon said upright



member by one of said plungers which is propelled by gas expelled from a respective one of said receptacles, causes said element to rock about said pivot; and

at least one figure adapted to rest on said perch and to be dislodged therefrom by rocking of said element in a direction towards whichever one of said plungers impacts said upright member first.

4,418,909

GOLF TEE

Anthony Messana, 2720 N. Ocean Blvd., Ft. Lauderdale, Fla. 33308

Filed Jun. 28, 1982, Ser. No. 392,644
Int. Cl.³ A63B *57/00*
U.S. Cl. 273—33 **6 Claims**

1. An improved golf tee for reducing undesirable golf ball rotation during flight after being struck by a golf club, said tee comprising:

a golf tee having a head portion and an elongated stem portion;

said head portion having an upwardly concaved socket portion for supporting a golf ball;

said stem portion positioned beneath said head portion for penetration into and support from the ground; and

an adhesive means;

said adhesive means attached to at least a portion of said socket portion; p1 said adhesive means for releasable attachment to a golf ball placed on said tee;

said adhesive means for effecting said reduction in golf ball rotation.

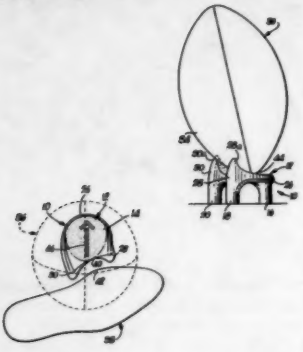
4,418,910
FOOTBALL KICKING TEE

Jan Stenerud, Overland Park, Kans., assignor to Jan Stenerud and Company, Inc., Shawnee Mission, Kans.

Continuation-in-part of Ser. No. 234,425, Feb. 13, 1981, abandoned. This application Apr. 23, 1982, Ser. No. 370,782

Int. Cl.³ A63B *67/00*

U.S. Cl. 273—55 B **21 Claims**



1. A tee for supporting a football to be kicked soccer style comprising:

an upwardly facing platform for receiving the toe of a football to be kicked;

means for supporting the platform in an elevated, generally horizontal position above the football field, said platform having a forwardmost portion when oriented for normal use by a soccer style kicker and a rear portion located rearwardly of said forwardmost portion; and

structure projecting upwardly from the platform generally at said rear portion of the platform and of an effective height and located in dispostion to engage the sidewall of a football placed on the platform to thereby maintain the football in a desired upright position as it is approached and then impacted by the upper instep side of the kicker's foot in performing a soccer style kick,

said structure including a pair of upstanding, upright elements projecting upwardly from the platform, spaced apart a distance less than the maximum width of the kicker's foot and located on opposite sides of the section of the platform upon which the toe of the football normally rests, means on said platform defining a forward-rearward axis for said platform,

one of the elements being positioned in closer spaced relationship to said forwardmost portion of the platform than the other element whereby a straight line between said pair of elements will intersect said axis at an acute angle thereto,

said one element being that element which is in closer proximal relationship to the kicker's toe when his foot is in normal instep impacting relationship to a football supported on said platform, than to the heel of the kicker's foot.

4,418,911
VIDEO GAME PLATFORM PROVIDING SPATIAL DISORIENTATION

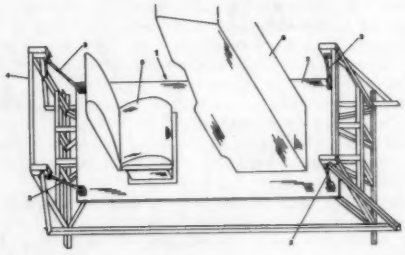
John B. Bowers, 126 Vine St., Chesterfield, Ind. 46017, and Rex A. Bowers, 2234 Urban-Dale, Shreveport, La. 71118

Filed Oct. 19, 1981, Ser. No. 313,056

Int. Cl.³ A63G *9/18;* **G09B** *9/08*

U.S. Cl. 273—85 G **1 Claim**

1. A swingable platform apparatus comprising a rectangular frame assembly adapted to stand on a floor and having a support post attached to and extending upward from each corner thereof wherein each of the said posts has mounted at the top thereof an inward extending support arm comprising a rectangular tubular member joined at one end to the said post and having attached to the other end thereof a downward opening channel bracket adapted to receive any of a plurality of like upper rod ends coupled thereto; a rectangular platform adapted to be suspended lengthwise of and above the frame assembly and adapted to receive a video game apparatus and an operator seat mounted thereon and adapted to support a video game apparatus, an operator seat, and an operator, and having bracket means attached thereto which bracket means are adapted to restrain and hold a video game apparatus and having an operator seat mounted thereon and having attached at each corner thereof an upward opening channel bracket adapted to receive any of a plurality of like lower rods ends coupled thereto; a plurality of like rod ends wherein each of the said rod ends is provided with an internally threaded barrel portion adapted to be coupled to a threaded end of a suspension rod and each of the said rod ends is swingably coupled by bolt means to one of the channel brackets; a plurality of like suspension rods, each rod having a plurality of right-hand threads at one end and a plurality of left-hand threads at the other end wherein each rod is adapted to be simultaneously coupled at one end to any of the upper rod ends and at the other end to any of the lower rod ends and is adapted to swingingly support a corner of the platform above the frame assembly; a downward opening cam follower assembly vertically mounted by bolt means to the bottom of the platform, comprising a cylindrical member externally threaded at the upper end



thereof and adapted for attachment to an internally threaded flange mounting and an internally threaded flange mounting attached to the threaded end of the cylindrical member and attached by bolt means to the platform, which downward opening cam follower assembly is adapted to receive a cam slidably and removably inserted therein; motor mounting means mounted on the frame assembly and adapted to support a vertically positioned motor comprising a pair of parallel and elevated motor mounting rails joined at their ends to a lengthwise extension of the frame assembly and having provided therebetween a motor mounting plate adapted to receive a motor mounted thereto; a vertically oriented motor mounted to the motor mounting means and having extending out of the top thereof a motor shaft adapted to receive a cam drive arm attached thereto; coupling means for coupling the motor to the motor mounting means; a horizontally mounted cam drive arm attached at one end to the motor shaft and adapted at its other free end to be coupled to a cam vertically displaced from the horizontal plane of the cam drive arm by a spacer; coupling means for coupling the cam drive arm to the motor shaft; a cam spacer attached to the free end of the cam drive arm which cam spacer is adapted to vertically displace a cam above the horizontal plane of the cam drive arm; a cam mounted to and above the free end of the cam drive arm and adapted to be slidably and removably inserted into the downward opening cam follower; and coupling means for coupling the cam spacer and cam to the free end of the cam drive arm.

4,418,912
AMUSEMENT DEVICE
Robert Tottey, Lansing North Apts., 211-D, Ithaca, N.Y. 14850
Filed Aug. 13, 1982, Ser. No. 407,932
Int. Cl.³ A63F 9/00
U.S. Cl. 273—138 R **14 Claims**

1. A coin-collecting amusement device in the form of an animal, comprising:

a. a hollow body capable of being substantially filled with a liquid having a top, a flat base, an opening located above the flat base, and at least one transparent side portion;

b. a target adapted to receiving a coin located inside the hollow body, on the flat base and disposed substantially under the opening;

c. coin path means for guiding a coin into the body having an upper slot end adapted to receiving a coin and a lower end communicating with the opening in the body, whereby the coin is guided from the slot into the body;

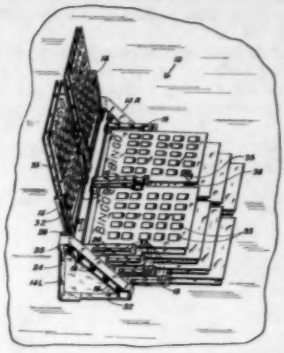
d. delay means in the coin path means for slowing the passage of the coin through the coin path means;

e. covering means for simulating an animal, substantially hiding the body, coin path means and delay means, whereby the amusement device is caused to appear in the shape of an animal;

f. said covering means revealing at least enough to the transparent side portion of the body to allow the target to be seen from outside the body.

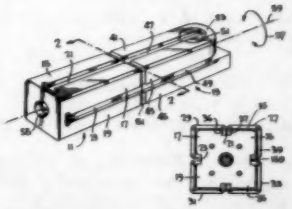
4,418,913
BINGO CARDS RACK AND CARD CLIP
Norman L. Hamilton, P.O. Box 391, Oilfield Rd., Cold Spring, Tex. 77331, and Charles B. Carpenter, San Leon, Tex., assignors to Norman L. Hamilton, Cold Spring, Tex.
Filed Apr. 26, 1982, Ser. No. 371,787
Int. Cl.³ A63F 3/06
U.S. Cl. 273—150 **13 Claims**

1. A rack for holding bingo cards and similar objects of generally rectangular shape, said rack including a multiplicity of horizontal pivot pins disposed and supported parallel to one another in ascending staircase relationship, and a subassembly pivotally mounted on each pivot pin and having two stable positions at the extremes of its rotary motion, an approximately vertical position and an approximately horizontal position, each said subassembly comprising a pair of clips received on said pivot pin through a transverse opening in one end of the clip, pocket-defining end and side members to receive and hold a marginal portion of a pair of back-to-back bingo cards or similar objects, and a pair of spring members to releasably restrain said cards in the pocket, said pair of clips being spaced



apart along said pivot pin to receive a pair of opposed such marginal portions.

4,418,914
TOY PUZZLE ARRANGEMENT
Peter Bauer, 13921 Esworthy Rd., Germantown, Md. 20874
Filed Jan. 11, 1982, Ser. No. 338,722
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S **11 Claims**



8. A toy puzzle arrangement comprising in combination: a base member formed to have a plurality of rail-like means as part thereof, said rail-like means bidirectionally oriented along first and second directions; a plurality of movable members each of which bears at least one indicium, said movable members formed and disposed to be slideably mounted on said rail-like means; turntable means formed to receive a movable member and enable it to be substantially rotated so that the indicium that it bears has its orientation changed; and positioning means formed and disposed to operate with said base member to receive a movable member and enable it to be moved in a third direction and further enable it to be transferred to said turntable means and selectively returned to said base member in seeking a solution to said puzzle; said base member and said positioning member being coupled by coupling means whereby said positioning member can be rotated orthogonally to said first and second directions.

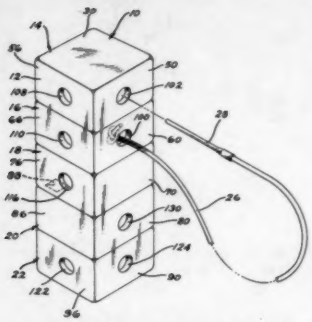
4,418,915
PUZZLE OF STACKED SEGMENTS
Robert A. Calebs, 7406 Cross Creek Blvd., Louisville, Ky. 40228
Filed Jun. 11, 1982, Ser. No. 387,384
Int. Cl.³ A63F 9/08
U.S. Cl. 273—159 **15 Claims**

1. A puzzle having a series of hollow segments in combination with a separate flexible connection comprising:

a. the series of hollow segments being arranged in a unitary stack and having assembly means joining the segments together about a longitudinal axis of the stack so that each segment is adapted to be turned about this longitudiral axis;

b. each hollow segment having certain side walls thereof formed with at least one hole, certain of the top and bottom walls of the segments having at least one corner hole;

c. all of the holes in the said side walls being visible on the



exterior of the puzzle at all times, while the holes of the top and bottom walls are visible after turning adjacent segments relative to each other to expose certain of the said corner holes;

d. the flexible connection being adapted to be threaded in a particular order through certain of said holes one time only, so that all visible holes in the segments are traversed by the flexible connection without running out of the necessary length of the flexible connection in order to solve the puzzle correctly.

4,418,916

TILT TOP GULF TEE

Norio Matsuura, 6-10-16, Mino-o, Mino-o city, Osaka, Japan (562)

Filed Jun. 8, 1981, Ser. No. 271,547
Claims priority, application Japan, Mar. 13, 1981, 56-20904
Int. Cl.³ A63B *57/00*
U.S. Cl. 273—207 **1 Claim**

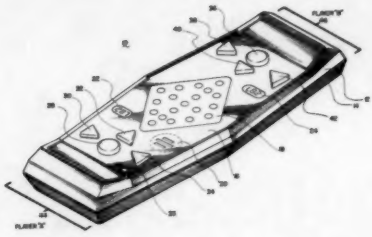
1. In a golf tee having a peg member including an elongated one end to be thrust into the ground, a head member for placement of a golf ball thereon, said head member having an axial bore formed therein, an elastic member disposed between the peg member and the head member, said elastic member being inserted in said bore, and, a pressure member which presses on said elastic member, and one end of said pressure member being secured to said peg member so that the lower surface of said head member and the upper surface of said peg member abut against each other, the improvement therein in which the pressure member comprises a stopper of a T-shape in cross section, a connecting element of a S-shape having one end hooked to said stopper, and a spring hook hooked to said connecting element.

4,418,917

ELECTRONIC TARGET GAME

Bijan Jalali, Huntington Beach, and Luan G. Tran, Redondo Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 29, 1980, Ser. No. 220,623
Int. Cl.³ A63F *9/02*
U.S. Cl. 273—313 **7 Claims**



1. An electronic game comprising:

a display including first, second and third sets of indicia;

input means responsive to commands from a player;

first control means responsive to the input means for causing the first set of indicia to represent a first moving projectile;

second control means responsive to the input means for causing the second set of indicia to represent a second moving projectile;

third control means responsive to the input means for causing the third set of indicia to represent a moving target;

first detection means for detecting a collision between either the first or second projectile and the moving target;

fourth control means responsive to the first detection means for causing the third set of indicia to represent a moving obstacle; and

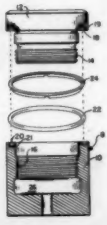
fifth control means responsive to the first detection means for causing either the first or second set of indicia to represent a moving ball.

4,418,918

STATIC SEAL DEVICE WITH PLASTICALLY DEFORMABLE METAL FOR CRYOGENIC REFRIGERATORS

Harry G. Nicoll, Norwell, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Mar. 14, 1983, Ser. No. 475,239
Int. Cl.³ F16J *15/08;* **F16L** *19/02*
U.S. Cl. 277—1 **24 Claims**



1. A face seal for sealing first and second components of a cryogenic refrigerator which define an enclosed chamber for the containment of pressurized gas comprising:

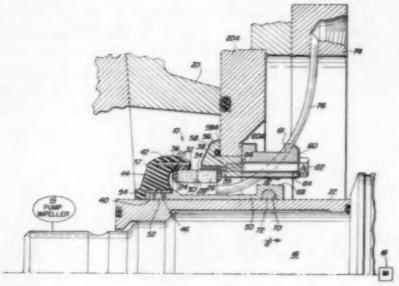
a. the first component having an annular recess on a mating face at a radius from a center line;
b. the second component having a mating face which forms a seal space with the first member when the mating faces of the two components are brought together;
c. a packing member comprising an annulus of material at the same radius as the seal space; and
d. an anti-rotation ring of the same radius as the annular seal space for insertion into said seal space, said ring having a bearing surface to allow rotation of one of the first and second components relative thereto and a wedge section for plastically deforming the packing member to form a seal between said first and second components.

4,418,919

MECHANICAL SEALS WITH SETTING BLOCK FOR USE WITH SLURRY PUMPS

Robert S. Wentworth, Temecula, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 1, 1983, Ser. No. 471,093
Int. Cl.³ F16J 15/34
U.S. Cl. 277—40 **11 Claims**



1. A mechanical seal assembly especially adapted for use with pumps whose pump product is abrasive and which is operatively associated with a pump housing and a motor-drive shaft driving a pump impeller, said seal comprising:
a rotatable seal ring operatively connected to and driven with said shaft;
a stationary seal ring operatively connected to said housing, each of said seal rings having a face opposing the face of the other seal ring and adapted to cooperate in sealing relation therewith;
an elastomeric assembly supporting said rotatable seal ring, said elastomeric assembly including an annular member formed of elastomeric material, and a pair of concentric bands bonded thereto, said bands being axially and radially spaced from each other, said elastomeric assembly, when placed in an operative position on said drive shaft, urging said rotatable seal ring toward said stationary seal ring and being loaded in shear in the zone between said bands.

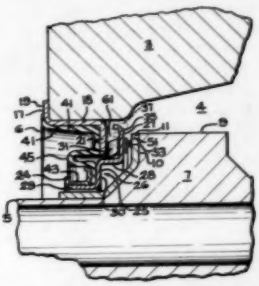
4,418,920

FLUID SEAL FOR ENGINE CRANKSHAFT APPLICATIONS

Jerome G. Belter, Mount Prospect, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 28, 1981, Ser. No. 335,150
Int. Cl.³ F16J 15/34
U.S. Cl. 277—50 **15 Claims**

1. A fluid seal for sealing between a stationary outer housing defining a chamber and a rotatable shaft having a sealing surface positioned in said chamber of said outer housing, said fluid seal comprising:
a raised surface on said shaft, said raised surface extending around the outer periphery of said shaft, said raised surface having a side that extends from said shaft in a direction substantially perpendicular to the surface of said shaft, said sealing surface located on said raised surface;
an outer case for connecting to said outer housing, said case adapted for extending around the outer periphery of said shaft;
a seal carrier for positioning in said housing, said seal carrier having a surface positioned adjacent said sealing surface on said shaft and an inner member extending around the outer periphery of said shaft, said inner member being in spaced apart relationship with said surface, said inner member positioned in spaced apart relationship to said outer case;
a elastomeric diaphragm extending from said outer case to said inner member, said diaphram being spaced apart from said surface of said seal carrier;



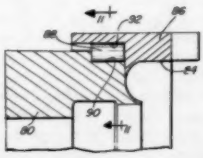
a cavity defined between said outer case and said seal carrier, said cavity acting to insulate said diaphragm to reduce the transfer of heat from said seal to said diaphragm, said cavity being in communication with said chamber in said outer housing whereby fluid in said chamber can flow into said cavity to cool said seal and said diaphragm, said diaphragm forming one wall of said cavity;
a seal positioned on said surface of said seal carrier for sealingly engaging said sealing surface on said shaft, said seal being spaced apart from said diaphragm whereby heat generated by said seal is not directly transferred to said diaphragm;
means for biasing said seal into sealing engagement with said sealing surface on said shaft.

4,418,921

MECHANICAL SEAL

Winfred J. Wiese, Whittier, and Joseph A. Marsi, Rancho Palos Verdes, both of Calif., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 8, 1981, Ser. No. 261,870
Int. Cl.³ F16J 15/34
U.S. Cl. 277—96.1 **4 Claims**



1. A mechanical seal assembly for use with a housing and a rotatable shaft, comprising:

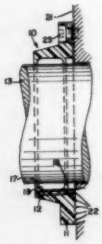
a stationary seal ring connected to said housing and encircling and spaced from said shaft;
a rotatable seal ring connected to and encircling said shaft;
said seal rings having opposed seal faces;
means connecting said rotatable seal ring to said shaft while permitting limited axial movement thereof with respect to said shaft;
said connecting means comprising an axially elongated, generally cylindrical drive ring;
said drive ring having a first portion closely surrounding at least a part of said rotatable seal ring rearwardly of the seal face thereof and a second portion extending rearwardly of said rotatable seal ring;
lug means on said second portion of said drive ring drivingly connecting said drive ring to said shaft;
a cavity defined in part by said drive ring in said second part thereof;
an elastomer U-cup in said cavity;
a U-cup follower engaging said U-cup;
spring means urging said U-cup follower and thus said U-cup into said cavity, said U-cup urging said rotatable seal ring toward said stationary seal ring; and
means drivingly connecting said drive ring to the outside of said rotatable seal ring.

4,418,922

TRIPLE CONTACT SEAL

Richard Janzito, St. Clair Shores, Mich., assignor to Martin Distributors, Livonia, Mich.

Filed Jan. 12, 1983, Ser. No. 457,496
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—152 **8 Claims**



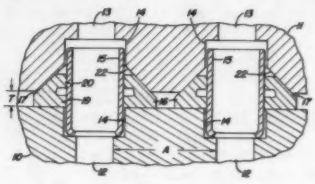
1. A triple contact seal for use on a shaft adjacent to a gear box, said seal including a circumferential body defining an aperture therethrough, a radial flange member, and a seal section connected to said radial flange member, said seal section extending in a direction away from said gear box, said seal section including an outer lip extending radially inwardly adapted to contact said shaft and an inner lip extending radially inwardly adapted to contact said shaft, said inner and outer lips being spaced apart from each other and defining a hollow chamber therebetween, said radial flange member including a sealing surface defined on the face of said flange member adjacent said gear box, said sealing surface including a plurality of circumferentially extending ribs adapted to contact the outer face of said gear box.

4,418,923

ENGINE OIL PASSAGE SEAL

Sabah Halabiya, Rheinhausen, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Feb. 7, 1983, Ser. No. 464,164
Claims priority, application European Pat. Off., Feb. 15, 1982, 82300738.0
Int. Cl.³ F16J *9/00, 15/12*
U.S. Cl. 277—167.5 **8 Claims**



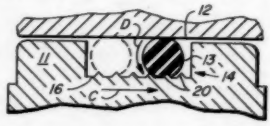
1. An engine oil passage seal of the type comprising a hollow dowel connecting oil passages in two casing parts and a sealing ring compressed around the dowel between the two casing parts, characterized in that the sealing ring has first and second annular webs which are joined at their outer peripheries, each web sealingly engaging a corresponding one of the two casing parts and at least the first web having a frustoconical outer surface which sealingly engages a surface of a frustoconical countersink in the corresponding casing part.

4,418,924

BI-SURFACE SEALING MECHANISM WITH ROLLING/SLIDING O-RING

James F. Mack, 541 N. Bertrand, Flagstaff, Ariz. 86001

Continuation-in-part of Ser. No. 199,112, Oct. 20, 1980, abandoned. This application Jun. 16, 1982, Ser. No. 388,929
Int. Cl.³ F16J *9/00, 15/56*
U.S. Cl. 277—177 **1 Claim**



1. In combination with a piston
having a cylindrical outer wall,
having an imaginary centerline parallel to said cylindrical outer wall, and
moving in a direction of travel parallel to said centerline,
and a stationary cylinder wall concentric and adjacent to said cylindrical outer wall of said piston,
(a) a circumferential groove formed in one of said concentric walls and including
(i) a floor having serrations formed therein,
(ii) a pair of upstanding generally opposed elongate curved walls,
the shortest distance across said groove between said opposed wall thereof being generally constant along the length of said circumferential groove, and
(b) an endless annular elastic hose generally having, prior to being compressed in said groove,
(i) a constant circular cross-sectional area along the length thereof, and
(ii) a smooth continuous cylindrical surface area,
said annular elastic hose being positioned in said circumferential groove against one of said opposed walls of said groove and compressed between
(c) said serrated floor of said groove, and

(d) a second surface formed integrally on one of said concentric walls,

said shortest distance across said groove being such that during movement of said piston in said direction of travel parallel to said centerline, said hose

(e) rolls away from one of said opposed walls of said groove and between said floor of said groove and said second surface toward said other of said pair of opposed walls of said groove,

(f) rolls to a position against said other of said pair of opposed walls of said groove, and

(g) maintains

(i) said position against said other of said pair of opposed walls of said groove, and

(ii) sliding contact with said second surface formed integrally on one of said concentric walls,

while said piston continues to move in said direction parallel to said piston centerline,

said serrations maintaining said hose in generally fixed position against said other of said pair of opposed walls of said groove while said piston continues to move in said direction of travel and causing said hose to roll at a generally equivalent rate along the length thereof from said one of said pair of opposed walls of said groove to said other of said pair of opposed walls of said groove.

4,418,925

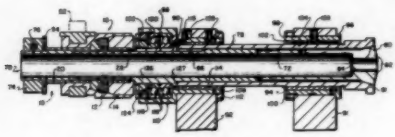
COLLET CLOSING MECHANISM

Florian I. Nowak, 16 Dean Dr., Newington, Conn. 06111

Continuation-in-part of Ser. No. 312,387, Oct. 19, 1981. This application Mar. 29, 1982, Ser. No. 363,104

Int. Cl.³ B23B *31/20*

U.S. Cl. 279—50 **15 Claims**



1. In a collet-operating mechanism, the combination comprising: a supporting sleeve member adapted for mounting upon a machine spindle; a flange portion extending circumferentially about said sleeve member and fixed thereon against axial movement in at least the rearward direction, said flange portion having an annular bearing surface on the oppositely directed forward face thereof; a collet-closing member slidably mounted for limited axial movement on said sleeve member and having a generally annular bearing surface disposed in confronting relationship with said flange portion bearing surface, at least one of said bearing surfaces being of generally frusto-conical configuration so as to coopertively define an inwardly tapered circumferential channel therebetween; a multiplicity of wedge members disposed in a circular array for radial movement within said channel and extending about said sleeve member, said wedge members having a cross-sectional configuration conforming generally to that of said channel and having bearing surfaces on the axially spaced, forward and rearward faces, and the radially outward face thereof, each of said bearing surfaces on said forward and rearward faces being of compound configuration with an outer and inner zone, the inner zones of said compound faces being bevelled with respect to the corresponding outer zones to define ridge lines therebetween upon which said wedge member can pivot against said flange portion and closing member bearing surfaces, the ridge line on said forward face being offset outwardly from that on said rearward face to permit rocking movement of said wedge member; and an operating sleeve member slidably mounted for axial movement on said supporting sleeve member, and having a sidewall portion extending over said outward faces of said wedge members and defining a compound circular recess therewithin comprised of a relatively large radius forward section, a relatively small radius rearward section, and a transition section therebetween, said operating sleeve member being movable between a rearward, open position in which said forward section of said recess is disposed over said circumferential channel, and a forward, closed position in which said rearward section is so disposed, the relatively large dimensions of said forward section of said recess permitting said wedge members to assume radially outward positions within said channel with said operating sleeve member in said open position, and the relatively small dimensions of said rearward section forcing said wedge members to radially inward positions with said operating sleeve member in said closed position thereof, said wedge members acting upon said bearing surfaces of said flange portion and said closing member to shift said closing member forwardly in said closed position of said operating sleeve member, whereby said closing member can effect closure of a collet operatively connected thereto, movement of said sleeve member from said closed position to said open position thereof promoting pivoting of said wedge members, thereby obviating any tendency for binding thereof in said channel, that might otherwise exist.

4,418,926

NONLOOSENING DRILL CHUCK

Günter H. Röhm, Heinrich-Röhm-Strasse 50, 7927 Sontheim, Fed. Rep. of Germany

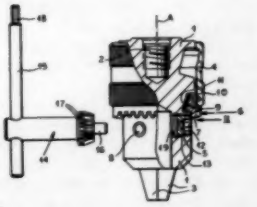
Filed Jun. 29, 1981, Ser. No. 278,066

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3025021

The portion of the term of this patent subsequent to Jun. 22, 1997, has been disclaimed.

Int. Cl.³ B23B *31/04, 31/12*

U.S. Cl. 279—62 **5 Claims**



1. A drill chuck comprising:

a chuck body rotatable about a chuck axis and formed with a radially outwardly open threaded bore;

a plurality of jaws radially displaceable on said body;

a tightening ring rotatable on said body about said axis and at least partially axially overlapping said bore;

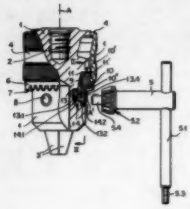
means including interengaging formations on said jaws and on said ring for radially displacing said jaws inwardly toward one another when said ring is rotated on said body in a tightening direction and for radially displacing said jaws outwardly away from each other when said ring is rotated on said body in a loosening direction opposite said tightening direction; and

a screw threaded in said bore and screwable therein in one direction for radial inward displacement in said bore and in the opposite direction for radial outward displacement into engagement with said ring, whereby when said screw is screwed out it engages said ring and blocks rotation of same.

4,418,927
LOCKABLE DRILL CHUCK

Günter H. Röhm, Heinrich-Röhm-Strasse 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,430
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3024996
The portion of the term of this patent subsequent to Jul. 29, 1997, has been disclaimed.
Int. Cl.³ B23B *31/04, 31/12*
U.S. Cl. 279—62 **8 Claims**



1. A drill chuck comprising:

a chuck body rotatable about a chuck axis and formed with a radially outwardly open groove having a rear surface and with a radially outwardly open recess spaced axially forwardly of said groove and having an inner surface extending generally perpendicularly of said chuck axis and spaced axially from said rear surface;

a plurality of jaws radially displaceable on said body;

a tightening ring rotatable on said body about said axis, received in said groove, and having a rear edge engaging said rear surface and a front edge spaced axially from said inner surface;

means including interengaging formations on said jaws and on said ring for radially displacing said jaws inwardly toward one another when said ring is rotated on said body in a tightening direction and for radially displacing said jaws outwardly away from each other when said ring is rotated on said body in a loosening direction opposite said tightening direction; and

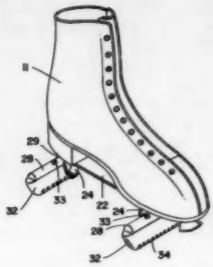
a locking element rotatable in said recess about a locking axis transverse to said chuck axis between a locking position wherein said element is, wedged axially tightly between said front edge and said inner surface and an angularly offset unlocked position wherein said element is substantially out of engagement with said front edge, whereby when said locking element is in said locking position it blocks rotation of said tightening ring on said chuck body.

4,418,928
ICE SKATE

Michael W. Cox, P.O. Box 2, Alamo, Calif. 94507

Filed May 18, 1981, Ser. No. 264,454
Int. Cl.³ A63C *1/30*
U.S. Cl. 280—11.14 **10 Claims**

1. An ice skate construction, comprising a longitudinally extending plate, a pair of ice engaging members, each secured to longitudinally opposed ends of said plate, each ice engaging member including a narrow, ice engaging lower surface, said ice engaging lower surface extending laterally and generally disposed transversely to the intended direction of travel, a plurality of recesses extending upwardly from said lower surface and spaced apart laterally therealong, said recesses defining a plurality of ribs, said ribs adapted to impinge on an ice

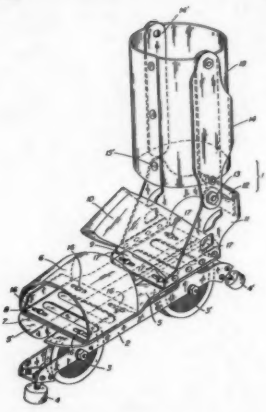


surface in sliding fashion, and means for securing said plate to the foot of a skater.

4,418,929
SINGLE ROLLER SKATE

William J. Gray, 4915 S. Braden, #12-E, Tulsa, Okla. 74135

Continuation-in-part of Ser. No. 138,236, Apr. 7, 1980, abandoned. This application Apr. 26, 1982, Ser. No. 371,660
Int. Cl.³ A63C *17/06*
U.S. Cl. 280—11.23 **3 Claims**



1. A single tract roller skate comprising,

(a) a platform formed from two aligned slotted plate segments having horizontal portions, the said segments extending downwardly and being joined together to form an undercarriage support member having two slots for mounting a front and a rear roller wheel on axles, the said roller wheel axles being directly mounted in the said slots of the said undercarriage, the said platform being slotted in the front part of the said horizontal portion to provide means to fasten

(b) a pair of slotted adjustable plates, slidably mounted on the front part of the said platform, the said plates being attached to each other respectfully, and to the said front part of the said platform by at least four screw bolts passing through at least four slotted sections in the said slotted adjustable plates and through four slotted sections in the said front part of the said platform, the said adjustable plates being positioned on the said platform so as to slide inwardly and outwardly across the said front part of the said platform, the said adjustable plates having a foot

support strap positioned between the said front part of the said platform and under the said pair of the said adjustable plates,

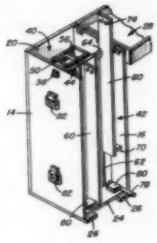
(c) an adjustable rear bracket mounted on the rear surface of the said platform having a base and an upper section, the said base section of said adjustable rear bracket having an adjustable plate mounted on the said base section, the said base section and the said adjustable plate each having slotted sections aligned with four slotted sections located in the said rear surface of the said platform, the said adjustable plate and the said base section of the said adjustable rear bracket both being attached to the said rear surface of the said platform by four screwbolts, the said upper section of the said rear bracket having two adjustable slotted segments lapped over each other to adjust the opening of the said upper section of the said rear bracket, the said rear bracket being adjustable inwardly and outwardly, the said rear bracket having a pair of strap webbing attached thereto with means to secure the said strap webbing in a closed curve.

4,418,930

BASEBALL/SOFTBALL CART

James J. Ryan, Jr., 8816 Rough Rider Rd. NE., Albuquerque, N. Mex. 87109

Filed Jul. 31, 1981, Ser. No. 288,190
Int. Cl.³ B62B *1/10, 1/26*
U.S. Cl. 280—47.19 **13 Claims**



1. A bat and ball cart comprising peripheral walls defining a vertically elongated housing with an interior, said housing having upper and lower ends, a bottom panel closing said lower end, a vertical partition transversely spanning the interior of the housing and defining two vertical compartments therein, each accessible through the upper end of the housing, said compartments comprising a bat compartment and a ball compartment, means dividing the interior of said bat compartment into a plurality of laterally aligned vertical cells, each cell adapted to vertically receive a bat and individually confining the bat, said ball compartment being adapted to receive balls therein for the full vertical height of the housing., and ball discharge means for vertically elevating balls within the ball compartment to the upper end of the housing for removal therefrom, said ball discharge means being located within said ball compartment and vertically moveable relative thereto, said ball compartment including at least one vertical pocket defined therein for receiving a vertical stack of balls, and means for selectively varying the width of said pocket for the selective accommodation of baseballs or softballs.

4,418,931

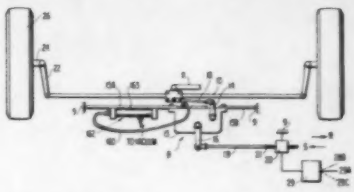
REMOTELY ADJUSTABLE STEERING COMPENSATOR

Durrell U. Howard, 306 Kramería Dr., San Antonio, Tex. 78213

Continuation-in-part of Ser. No. 93,968, Nov. 14, 1979. This application Aug. 27, 1981, Ser. No. 296,617
Int. Cl.³ B62D *5/06, 15/00*
U.S. Cl. 280—94 **42 Claims**

1. A steering compensator apparatus for use on a vehicle having a steering system for moving at least one steerable member to either side of a preselected position in response to a steering force transmitted through a reduction gear, said apparatus comprising:

resistance means connected to said steering system at a location between said steerable member and said reduction gear for providing a resistance force preventing substantial movement of said at least one steerable member away from said preselected position until the steering



force on the low ratio side of said reduction gear exceeds a predetermined value;

activating means operable for varying the amount of resistance force provided by said resistance means; and,

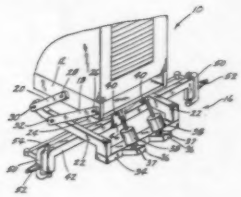
control means for operating said activating means from a location remote to said resistance means such as a driver's station of said vehicle so as to selectively vary the amount of said resistance force while said vehicle is in operation.

4,418,932

FRONT AXLE SUSPENSION SYSTEM FOR A VEHICLE CHASSIS

Paul W. Claar, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 24, 1980, Ser. No. 200,211
Int. Cl.³ B60G *9/02*
U.S. Cl. 280—112 R **4 Claims**



1. A front axle suspension system for an agricultural tractor chassis having forward and rearward ends and a longitudinal axis, comprising,

first and second pairs of links, each link having upper and lower ends and each pair of links being pivotally secured at their upper ends to opposite sides of said chassis and said pairs of links being adapted to pivot in unison about substantially horizontal axes transverse to the longitudinal axis of said chassis, said second pair of links being positioned rearwardly of said first pair of links,

a coupler pivotally connected to the lower ends of said first and second pairs of links and extending forwardly therefrom,

a generally horizontal front axle connected to said coupler link,

means for mounting at least one wheel on said front axle for rotation about a generally horizontal wheel centerline, and

a dampener means interconnecting said coupler link and chassis to yieldably resist movement of said axle relative to said chassis,

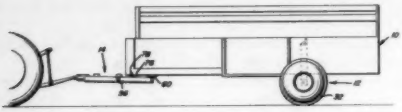
the pivotal connections of said first and second pairs of links and said coupler link being so arranged that the instantaneous center of said suspension system in moveable in response to pivotal movement of said first and second pairs of links and said coupler link and will always be below and rearwardly of said wheel centerline and said first and second pairs of links and said coupler link being so arranged that said horizontal axle is reciprocally moveable in an upwardly and rearwardly inclined plane relative to said chassis in response to pivotal movement of said links.

4,418,933

TRANSPORT FOR TRANSVERSE FARM EQUIPMENT HEAD

James D. Wilcox, Jr., Rte. #1, Cleghorn, Iowa 51014

Filed Jul. 16, 1981, Ser. No. 284,100
Int. Cl.³ B62D *21/12*
U.S. Cl. 280—400 5 Claims



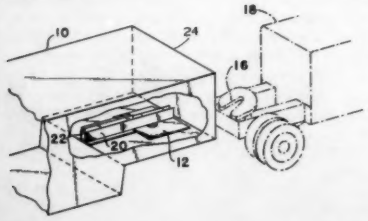
1. In combination with a horizontally elongated farm equipment head adapted to be transversely advanced and having first and second ends and front and rear sides, a mount component semi-permanently supported from said head adjacent but spaced from one end of said head toward the other end thereof and including a first upstanding portion extending upwardly along said rear side and a second elongated horizontal portion including opposite ends, said second portion being carried by the lower end of said first portion with one end of said second portion disposed adjacent the lower end of said first portion and the other end of said second portion projecting transversely beneath said head toward the front side thereof, a pair of right and left elongated axle assemblies each including a mounting end and a wheel journalling end, the opposite ends of said second elongated horizontal portion defining right and left mount portion, said mount portions ans said mounting ends including coacting means releasably supporting said mounting portions from said second portion ends with said wheel journalling ends being disposed horizontally and generally parallel each other, and support wheels journalled from the wheel journalling ends of said axle assemblies.

4,418,934

PIVOTAL BOLSTER PLATE

Carl F. Mickey, High Point, N.C., assignor to W. F. Mickey Body Company, Inc., High Point, N.C.

Filed Apr. 6, 1982, Ser. No. 365,954
Int. Cl.³ B62D *53/08*
U.S. Cl. 280—438 R 8 Claims



1. A pivotal mounting for a bolster plate on a trailer which has an elongated support extending longitudinally in the center of a bottom of a forward portion of the trailer, the mounting comprising

a shaft extending parallel to the trailer support,

a pair of thrust bearings mounted on the support and rotatably supporting opposite ends of the shaft,

a bolster plate secured for rotation with the shaft on the bottom side of the shaft,

a king pin mounted on the bolster plate, and

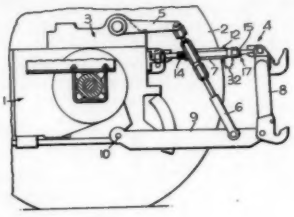
a center bearing mounted on the support and having bottom groove-like bearing means engaging a center portion of the shaft on the upper side of the shaft.

4,418,935

PIN LOCK FOR ADJUSTABLE LINK OF A THREE-POINT HITCH

John W. O'Connor, Hales Corners, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 14, 1981, Ser. No. 330,508
Int. Cl.³ B60D *1/14*
U.S. Cl. 280—461 A 11 Claims



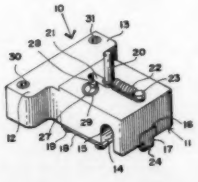
1. A three-point hitch having a lock on an adjustable length link comprising, an internally threaded sleeve threadedly receiving an externally threaded screw member forming a threaded interface between the sleeve and screw member, said sleeve having a shoulder on the end receiving said screw member, means defining a slot interrupting the threaded interface formed by said sleeve and said screw member, a pin received in said slot to prevent relative rotation between said sleeve and said screw member, a latch on said pin including a ring biased toward the side of said pin engaging the shoulder on said sleeve preventing its movement from the slot in said link.

4,418,936

TOW BAR HEAD FOR AIRCRAFT

Kenneth E. Adams, 11021 SW. 44th St., and Bertram C. Adams, 11370 SW. 60th Ter., both of Miami, Fla. 33165

Filed May 28, 1982, Ser. No. 383,240
Int. Cl.³ B60D *1/14*
U.S. Cl. 280—493 7 Claims



1. In a tow bar coupling head for commercial aircraft of the type equipped with a cylindrical cross pin for tow bar coupling, the combination comprising, a steel tow bar head body member, said body member being of substantially rectangular shape, means for removably joining the rearward end of said body member to a tow bar, and means for releasably intercon-

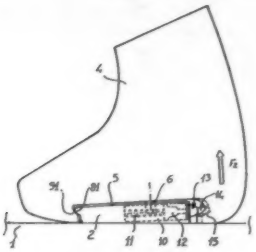
necting a forward end portion of said body member to an aircraft cross pin, said releasable interconnecting means comprising a transverse slot in the underside of said body member and in spaced relation with respect to said forward end of said body member, the underside of said body member further having a longitudinally-extending recess open at the forward end of said body member, and a slide lock member slidingly received within said longitudinal recess and movable between covering and uncovering positions with respect to said transverse slot for selectively locking and unlocking an aircraft towing cross pin received within said transverse slot.

4,418,937

LATCHING APPARATUS FOR USE WITH SKI BINDING

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, S.A., Annecy, France

Filed Nov. 25, 1980, Ser. No. 210,222
Claims priority, application France, Nov. 28, 1979, 79 29807
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—613 **44 Claims**



1. A latching apparatus for use with a ski binding, said apparatus comprising:

(a) a latching element adapted to be pivotable multidirectionally around more than one axis upon the application of an external force, said latching element comprising a shoulder;

(b) elastic means adapted to bias said latching element and to allow for the multidirectional pivoting thereof;

(c) support means adapted to support said shoulder with at least a portion of said latching element extending through said support means; and

wherein said elastic means comprises at least two spring means, each of said spring means being positioned on opposite sides of a plane of symmetry extending through said latching apparatus.

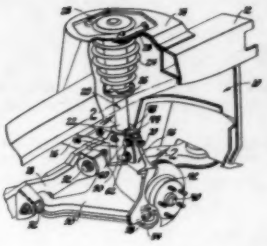
4,418,938

VEHICLE STRUT SUSPENSION WITH CAMBER ADJUSTMENT

Floyd A. Sullivan, Grand Ledge; Arthur H. Elbers, Holt, and Charles M. Trierweiler, Lansing, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 21, 1981, Ser. No. 304,320
Int. Cl.³ B62D *17/00*
U.S. Cl. 280—661 **3 Claims**

1. In a vehicle wheel suspension including a wheel support means, a wheel thereon, a strut arranged on a generally upright axis and connected at its upper end to the vehicle sprung mass and at its lower end adapted for connection to the wheel support means, and a lateral arm member swingably mounted at an inner end on the sprung mass and connected at its outboard end by joint means to a lower end of the wheel support means, the improvement which comprises, said axis of said strut being so disposed relative to the median vertical plane of said wheel as to create a force couple urging the top of said wheel inboard of the vehicle sprung mass, a pair of bracket walls on said strut lower end and including upper and lower sets of horizontally aligned bolt holes, a portion of said wheel support means received between said bracket walls and including upper and lower bolt-receiving apertures each registered in combination with a corresponding said set of bolt holes, bolt fasteners extending through each said bolt hole sets and registered apertures, one of said aperture or bolt hole set of one of said bolt hole set and registered aperture combinations being of enlarged size in direction inboard and outboard the vehicle sprung mass relative the size of said bolt fastener to permit a limited range of relative movement between said strut lower end and said wheel support portion for wheel camber adjustment, and a set screw otherwise unconstrained but threadedly mounted in one of said wheel support portion or strut lower end adjacent said enlarged aperture or bolt hole set and extending transversely of the vehicle sprung mass, said set screw having its inboard end exposed to be abutted under the urging of said force couple against the other of said strut lower end and wheel support portion whereby to provide thereat a physical stop resisting said force couple, said set screw being threadable transversely to locate said wheel support means at a selected camber setting within the range of movement permitted by said enlarged aperture or bolt hole set.

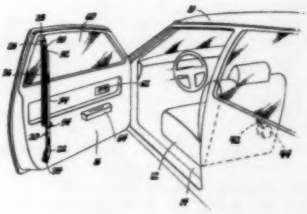


4,418,939

STORAGE OF A SEAT BELT ON A DOOR

Larry D. Miller, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1982, Ser. No. 345,081
Int. Cl.³ B60R *21/02*
U.S. Cl. 280—803 **2 Claims**



1. In an occupant restraint system having a shoulder belt end mounted on the upper rear corner of the door and a lap belt end mounted on the lower rear corner of the door and a first buckle element carried by the shoulder belt and lap belt and adapted for engagement within a second buckle element mounted on the vehicle body inboard the occupant seat so that lap and shoulder belt portions are established in restraining positions across the seat when the door is closed, said second buckle element permitting disengagement of the first buckle element therefrom; the improvement comprising:

an auxiliary storage element mounted on the upper rear corner of the door and adapted for engagement by the first

buckle element so that the lap belt portion and shoulder belt portion are stored in a generally vertically hanging relationship along the door, and a slip ring encircling both the lap and shoulder belts, said slip ring being slidable along the lap and shoulder belts so that the slip ring assumes a position adjacent the first buckle element when the first buckle element is engaged with the second buckle element to enable separate positioning of the lap and shoulder belts across the seat and said slip ring falling along the vertically hanging lap and shoulder belts when the first buckle element is engaged in the auxiliary storage element so that the slip ring couples the shoulder belt and lap belt in overlying neat stored relationship along the door.

4,418,940

COUPLING ASSEMBLY FOR THE DRIVE DEVICE OF A PASSIVE VEHICLE OCCUPANT RESTRAINT BELT SYSTEM

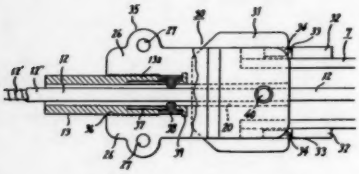
Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan

Filed May 28, 1981, Ser. No. 267,891

Claims priority, application Japan, Jun. 13, 1980, 55-081832[U]

Int. Cl.³ B60R *21/00*

U.S. Cl. 280—804 **4 Claims**



1. In a passive vehicle occupant restraint belt system having a drive wire received in a casing along the part of its length that is adjacent a guide rail, such part of the drive wire having a covering of polymeric material that carries a lubricant to facilitate movement of the wire longitudinally through the casing, a coupling assembly for joining the casing to the guide rail comprising a coupling member having a socket adapted to receive and retain an end portion of the casing, a connector portion fitted to the guide rail, means for joining the connector portion to the guide rail, a hole through the connector portion communicating the socket with the guide rail and receiving the drive wire for longitudinal movement, and a sealing ring received within the hole in sealing engagement with the drive wire to confine the lubricant to the casing and prevent it from intruding into the guide rail.

4,418,941

COLOR-FORMING SHEET FOR NO-CARBON COPYING PAPER

Mitsuru Fuchigami; Mamoru Ishiguro, both of Takasago, and Hideo Ohye, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Oct. 19, 1981, Ser. No. 312,912

Claims priority, application Japan, Oct. 22, 1980, 55-148063

Int. Cl.³ B41M *5/22*

U.S. Cl. 282—27.5 **8 Claims**

1. No-carbon copying paper with improved edge padding aptitude layered in sets each comprising one color forming upper sheet and one color developing lower sheet, said color-forming sheet being coated with a coating color basically composed of color former-containing synthetic resin microcapsules, a capsule protective agent and an adhesive, said coating color containing a nonionic surface active agent having a hydrophilic-lipophilic balance (HLB) of 10 or above in an amount of 0.1 to 4% by weight based on the microcapsules, the cut face of the no-carbon copying paper layered in sets being covered with a hydrophilic fan apart adhesive.

4,418,942

MICROCAPSULE SHEET FOR PRESSURE-SENSITIVE RECORDING PAPER

Noriyuki Hosoi; Yoshiyuki Hoshi, and Hiroharu Matsukawa, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 29, 1981, Ser. No. 335,487

Claims priority, application Japan, Dec. 29, 1980, 55-185667

Int. Cl.³ B41M *5/22*

U.S. Cl. 282—27.5 **15 Claims**

1. A wrinkle-free pressure-sensitive microcapsule recording paper, prepared by a process comprising the steps of

providing a support base paper;

coating one surface of said support base paper with a color developer-coating solution wherein said color developer-coating solution is comprised of a color developer dissolved or dispersed in a solvent selected from the group consisting or organic solvents and water; and

coating the other surface of said support base paper with a microcapsule coating solution, wherein said microcapsule coating solution is comprised of microcapsules, a binder, a surfactant, and a protective agent, wherein said microcapsules contain an electron-donating color former, said binder has a solid content of 20 to 50 parts by weight per 100 parts by weight of the solid content of said microcapsules, wherein said surfactant is used in an amount such that the solid content is 0.0001 to 10 parts per 100 parts by weight of said solid content of said microcapsules and has a hydrophobic atomic group of the formula:

$$R_1\text{—OOC—}\underset{\displaystyle |}{\text{CH}}\text{—}$$
$$R_2\text{—OOC—}\text{CH}_2$$

wherein R_1 and R_2 are each an aliphatic hydrocarbon having 2 to 20 carbon atoms or aromatic hydrocarbon having 6 to 20 carbon atoms.

4,418,943

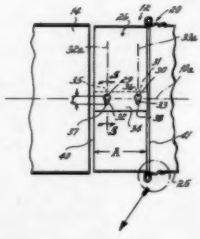
DUCT FITTING

Samuel A. Ionna, Cincinnati, Ohio, assignor to The Williamson Company, Cincinnati, Ohio

Filed Aug. 24, 1981, Ser. No. 295,788

Int. Cl.³ F16L *25/00*

U.S. Cl. 285—12 **14 Claims**



1. A duct fitting that allows connection of said fitting to either the female or the male end of a duct, said fitting comprising

a ring and a collar assembled one with another, said collar being expandable relative to said ring between a maximum circumference position position defining means on said collar defining said minimum and maximum position, and a minimum circumference position, said collar being re-

ceivable over the male end of a duct in said maximum position and being receivable within the female end of a duct in said minimum position, and

connector means by which said collar is connected with said ring, said connector means being structured to permit expansion and contraction of said collar rotative to said ring as desired by said fitting's user, said connector means comprising

an inwardly turned bead fixed on one of said ring and said collar, and

a flange connected to the other of said ring and said collar, said bead and said flange cooperating to permit said collar to be expanded or retracted as desired by said fitting's user without substantial relative axial movement therebetween.

4,418,944

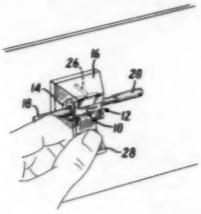
FLUID COUPLING

Stephen W. Haines, 13616 Utt Dr., Tustin, Calif. 92680; Stephen R. Marshall, 25971 Cordillera Dr., Mission Viejo, Calif. 92675; Mark E. Steen, 3343 Gingham Ct., Chino Hills, Calif. 91710, and Robert C. Swanland, P.O. Box 2815, Riverside, Calif. 92506

Filed Feb. 11, 1981, Ser. No. 233,360

Int. Cl.³ F16L *35/00*

U.S. Cl. 285—24 **11 Claims**



1. In a fluid coupling having a male member including a generally rigid base portion and an attached, relatively resilient face portion and a first fluid flow path, having a centerline, extending therethrough from an opening in the resilient face portion, and a female member including a body portion having a generally cylindrical bore extending therethrough with an opening in one wall of the female body portion communicating with the bore along its full length and cooperating therewith to form a generally C-shaped receptacle for receiving and rotatably supporting the male member, the female member having a second fluid flow path opening from a generally arcuate wall of the receptacle for fluid communication with the first fluid flow path in the male member, the improvement comprising,

first cam surface means formed on said female member in substantially diametrically opposed relation to said second fluid flow path opening,

second cam means on said male member in position to engage and cooperate with said first cam means on said female member, said second cam means being located on said male member on a surface thereof substantially opposite said first fluid flow path opening,

said male member being dimensioned when oriented in a first position to be passed through said opening in said one wall of the female member into said receptacle, and to be retained in the receptacle when rotated to a second position,

said first fluid flow path opening and said second fluid flow path opening being aligned and in fluid communication when said male member is in said second position,

detent means on one of said male and female members and cooperating with the other of said male and female members to releasably retain said male member in said second position,

means for aligning said first fluid flow path and said second fluid flow path in said second position,

said first and said second cam means being located to urge said male and female members together whereby said resiliently face portion is forced into sealing engagement with said female member with a sealing force directed along the opening to the fluid flow path in the male member when the male member is rotated to the second position, and

a substantially linear third fluid flow path having a centerline and extending through the male member from end portions received at ends of the receptacle and transversely to and in communication with the first fluid flow path, said first fluid flow path and said third fluid flow path being oriented such that the centerlines of said first fluid flow path and said second fluid flow path essentially intersect, whereby the fluid coupling is a T coupling,

said rotation being about an axis substantially parallel to said linear third fluid flow path.

4,418,945

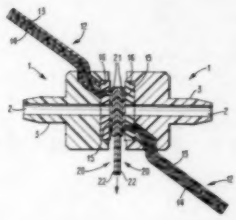
STERILE CONNECTORS

Robert M. Kellogg, Washington Crossing, Pa., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 8, 1981, Ser. No. 270,954

Int. Cl.³ F16L *55/00*

U.S. Cl. 285—70 **29 Claims**



1. A sterile connector comprising:

a resilient, deformable washer having an aperture and a passage therein,

a continuous, removable, yieldable strip material a portion of which is removably adhered to said washer and overlies said aperture, another portion thereof extending through said passage,

means surrounding said another portion of said strip connected to said passage for receiving said a portion of said strip material when a force is applied to said means and said another portion to expose said aperture.

4,418,946

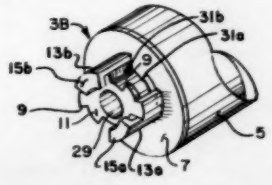
QUICK ACTING COUPLER

Thomas F. Gambon, 12815 Greenville La., St. Louis, Mo. 63141

Filed Feb. 6, 1981, Ser. No. 232,166

Int. Cl.³ F16L *37/24*

U.S. Cl. 285—73 **3 Claims**



1. A connector for coupling two objects together and for transmitting axial, shear, and bending loads between the ob-

jects, said connector comprising a pair of identical connector members, one for each said object, each of said connector members being a one piece member capable of being molded in a pull apart mold, each said connector member having a base, a hub projecting axially outwardly from said base, said hub having an end face, a pair of arms integral with said base on on generally diametrically opposed sides of the hub extending out beyond the end face of the hub, each of said arms having a flange projecting radially inwardly, and a pair of grooves in the side of the hub, said arms and grooves alternating with one another and being substantially equally angularly spaced relative to one another around the hub, said hub further having a partial flange adjacent the end face of the hub and closing off a portion of each of said axial grooves and having a gap of sufficient distance between the end of the partial flange and the opposite side of the groove to permit said arm and flange of the other connector member to be axially received therein as the connector members are moved axially relative to one another into an interfit position in which said flanges and arms of both of said connector members are received in said axial grooves of the other connector members, said flanges and partial flanges having cooperable surfaces thereon which are cammingly engagable with one another upon rotation of said connector members relative to one another from their interfit position to a coupled position so as to axially draw said connector members together, said base having a pair of part circular openings therethrough adjacent said hub on opposite sides thereof, each of said part circular openings spanning an arc substantially similarly to the arc spanned by its respective flange and partial flange enabling a straight through mold part to form portions of said flanges, said partial flanges, and said axial grooves.

4,418,947

SWIVEL JOINT FOR IMPROVED BEARING AND SEAL LIFE

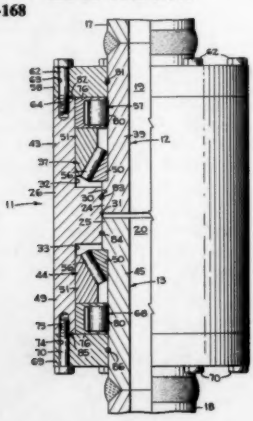
Larry J. Talafuse, Denver, Colo., assignor to FMC Corporation, Chicago, Ill.

Filed Feb. 19, 1981, Ser. No. 235,865

Claims priority, application United Kingdom, Mar. 21, 1980, 8009731

Int. Cl.³ F16L *27/00*

U.S. Cl. 285—168 **5 Claims**



1. A swivel joint for connecting two lengths of pipe, said joint having extended bearing and seal life, said joint comprising:

an annular sleeve having an axial passage extending through said sleeve;

first and second annular inner members each having an axially extending bore therethrough;

means for rotatably mounting said first and second inner members in said axial passage of said annular sleeve;

a first thrust bearing means mounted between said sleeve and said first inner member for absorbing axial thrust between said sleeve and said first inner member;

a second thrust bearing means mounted between said sleeve and said second inner member for absorbing axial thrust between said sleeve and said second inner member;

a first unidirectional unit connected between said sleeve and said first inner member to allow said sleeve to rotate in a first direction relative to said first inner member and prevent said sleeve from rotating in a second direction relative to said first inner member;

a second unidirectional unit connected between said sleeve and said second inner member to allow said sleeve to rotate in said second direction relative to said second inner member and prevent said sleeve from rotating in said first direction relative to said second inner member; and

sealing means mounted between said sleeve, and said first and said second inner members.

4,418,948

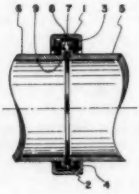
ELASTIC COUPLING FOR PIPES AND TUBES

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Ronald R. Chapman, 9425 Calle El Milagro, Tucson, Ariz. 85704

Filed May 6, 1981, Ser. No. 261,042

Int. Cl.³ F16L *25/00, 17/00, 27/10, 21/00*

U.S. Cl. 285—420 **3 Claims**



1. An elastic coupling for coupling two abutting ends of tubes, said elastic coupling comprising in combination:

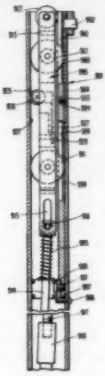
(a) a rigid clamping collar of substantially closed loop including a groove disposed along the inward side of said rigid clamping collar, said rigid clamping collar constructed in a split structure and having means for clamping down around two tube sections having circumferential flanges at the abutting ends; and

(b) a segmented hollow elastic ring of a substantially annular cross section having a slitted opening disposed along the inward side of said segmented hollow elastic ring for receiving and containing a pair of circumferential flanges of two tube sections disposed at the abutting ends, said segmented hollow elstic ring confined circumferentially within said groove included in said clamping collar wherein the clamping down action of said rigid clamping collar generates a hoop compression on said substantially annular cross section of said segmented hollow elastic ring and narrows down said slitted opening included in said hollow elastic ring for compressive coupling of a pair of circumferential flanges of two tube sections disposed at the abutting ends.

4,418,949
PANIC HANDLE FOR DOORS

William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 185,375, Sep. 8, 1980, which is a continuation-in-part of Ser. No. 152,403, May 22, 1980, Pat. No. 4,366,974. This application Feb. 22, 1983, Ser. No. 468,134
Int. Cl.³ E05C 15/02
U.S. Cl. 292—92 4 Claims

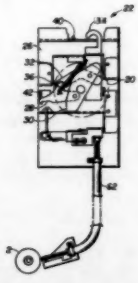


1. A door and panic handle combination comprising bar means mounted on and extending from a location along an edge of the door to a location inwardly thereof, substantially parallel to the door; said bar means having a means for engagement by a user at the inward location thereof; latch means concealingly housed inside the bar means and terminating in a latch bolt at said location along the edge of the door; with the bar being mounted for limited pivotal movement toward and away from said door between latched and unlatched positions thereof.

4,418,950
MOTION SENSING APPARATUS

Harry A. Penhasi, Cupertino, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 9, 1981, Ser. No. 223,596
Int. Cl.³ E05C 3/14
U.S. Cl. 292—144 4 Claims



1. In a safety latching apparatus for a cover of a housing enclosing a round rotatable member including a latch member mounted on one of said cover and said housing and movable between a locked position and an unlocked position, and an elongated flexible control element having one end interacting with said latch member and the other end located adjacent said rotatable member, said control element having a single generally uniform elongated configuration between said one end and said other end, said control element movable longitudinally so that said other end moves between a first position abutting the surface of said rotatable member when said rotatable member is stationary and a second position deflected to one side of said rotatable member when said rotatable member is rotating, said control element being generally rigid to a force in the longitudinal direction when said other end is in said first position allowing said latch member to move to said unlocked position and presenting no rigidity to a force in the longitudinal direction when said other end is deflected to said second position permitting said one end to recede slightly and thereby preventing said latch member from moving to an unlocked position, the improvement comprising:

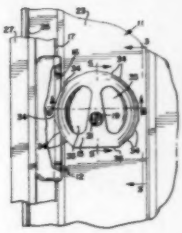
means for assuring that said other end remains generally rigid when in said first position abutting the surface of said round rotatable member, said means including an anti-flexing guide member positioned along the side of said other end opposite the direction said other end is intended to be deflected by said rotatable member; and

locating said other end so that the longitudinal axis of said other end is laterally displaced a slight distance in the direction opposite to the direction of intended deflection from a line intersecting the central axis of said rotatable member so that said other end when in said first position is biased toward deflection in the direction of displacement against said anti-flexing guide.

4,418,951
ROTARY LATCH FOR SCREEN DOOR

Steven C. Schultz, and Thomas A. Vaughn, both of Rice Lake, Wis., assignors to Nichols-Homeshield, Inc., Aurora, Ill.

Filed Jul. 16, 1981, Ser. No. 283,951
Int. Cl.³ E05C 3/04
U.S. Cl. 292—202 6 Claims



1. A door latching arrangement including a door pull member mounted on a sliding door and a rotary cam member disposed at a right angle to the door pull member and mounted on a part to provide a locked relationship against relative sliding movement of the members, said door pull member having an open locking slot, said rotary cam member entering through said locking slot to engage said sliding door, said cam member being eccentrically mounted to move toward a locked position and when released to move toward unlocked position, and said cam member being provided with a plurality of flat faces about its periphery adapted to engage said door in a step-by-step movement.

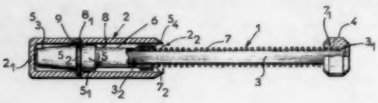
4,418,952
SEAL DEVICE

Claude D. Y. Wallet, 101 Avenue Charles de Gaulle, 95160 Montmorency, France

Filed Jun. 26, 1981, Ser. No. 277,740
Claims priority, application France, Jun. 27, 1980, 80 14375
Int. Cl.³ B65D 33/34
U.S. Cl. 292—327 8 Claims

1. A seal device applicable, especially to closure means for

the doors of wagons, trucks, trailers, containers and the like, comprising a male part and a female part, said male part comprising an elongated shank having first and second ends, protuberant stop means at said first end for preventing withdrawal of said shank from said closure means by said first end, and a male ferrule on said second end having smaller lateral dimensions than said stop means thereby allowing insertion of said shank in said closure means by said second end, said female



part having a socket for reception of said male ferrule, and said device including locking means for cooperating with said male ferrule and said socket to couple said male and female parts within said socket when said male ferrule is inserted in said socket, whereby said female part prevents withdrawal of said shank from said closure means, characterized in that said shank comprises a metal cable and a coil spring surrounding said cable from said stop means to said male ferrule, said spring having close but non-coil bound turns.

4,418,953

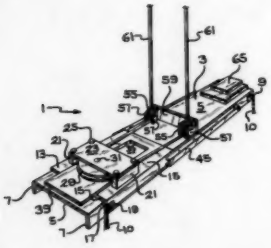
MATERIAL HANDLER

Glenn G. Dunbar, 2608 Overbrook, Toledo, Ohio 43614

Filed Feb. 4, 1981, Ser. No. 231,380

Int. Cl.³ B66C *19/00, 1/66*

U.S. Cl. 294—67 A **5 Claims**



1. A material handler comprising:

a generally U-shaped first member, said first member having means for supporting a load;

a generally U-shaped second member slideably positioned on said first member, said second member having means for supporting a load, said second member containing an opening;

a spacer positioned on said first member, said spacer positioned in said opening of said second member, said spacer acting to limit the range of movement of said second member with respect to said first member;

biasing means attached to said first and second members, said biasing means acting to maintain said second member in a predetermined position with respect to said first member;

means for lifting said material handler, said lifting means being connected to said second member and slideably connected to said first member whereby said lifting means will exert a force on said second member to cause said second member to slide with respect to said first member whereby the position of said support means on said second member will move with respect to the support means on the first member to accommodate various size loads being handled by said material handler.

4,418,954

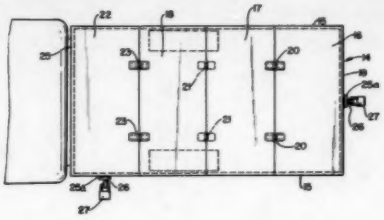
FOLDABLE COVER FOR A TRUCK BED

John A. Buckley, 74 Hillside Rd., Sparta, N.J. 07877

Continuation-in-part of Ser. No. 172,995, Jul. 28, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 350,732

Int. Cl.³ B60P *7/02*

U.S. Cl. 296—100 **8 Claims**



1. A foldable cover assembly for a vehicle having a pair of vehicle side walls and a vehicle end wall defining an open bed for carrying articles, said bed having a rear, central and forward section, wherein said cover comprises:

(a) a pair of support members mounted lengthwise above each of said vehicle side walls and extending along the rear and central sections of said bed; each support member having a rearward and a forward edge;

(b) a rear cover member extending across said support members at the rear section of said bed, said rear cover member having a vertical rear wall aubtting the rearward edges of said support members to enclose the rear section of said bed;

(c) a first central cover panel extending across said support members adjacent said rear cover member, said first central cover panel pivotably connected to said rear cover member;

(d) a second central cover panel extending across said support members adjacent said first central panel, said second central panel pivotably connected to said first central panel, said first and second central cover panels overlying said central section; and

(e) a forward cover member enclosing the forward section of said bed having a pair of side walls and a forward end wall, said cover member pivotably connected to said second central panel, said pair of side walls abutting the forward edges of said support members and said forward end wall enclosing the forward section of said bed.

4,418,955

SUPPORT UNIT FOR A CAB IN UTILITARIAN VEHICLES

Ludwig Muncke, Lohr, and Wolfgang Kaus, Lohr-Wombach, both of Fed. Rep. of Germany, assignors to G. L. Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,465

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1980, 3025269

Int. Cl.³ B60P *3/03*

U.S. Cl. 296—190 **4 Claims**

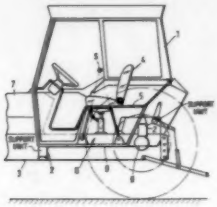
1. A support unit for a cab of a utilitarian vehicle having a separate cab and chassis, said support unit comprising:

a hydraulic support cylinder unit including a cylinder, a piston and a spring element, said piston being axially fixed to one of said chassis and said cab, and said spring element being connected to the other of said chassis and said cab;

a directional control valve having a housing fixed to said cylinder of said hydraulic support cylinder unit and including a valve body;

a first hydraulic line connecting said directional control valve to said hydraulic support cylinder;

a lever pivoted to said cab and having a lever arm to which said valve body is journaled;
a first rod having one end journaled to said lever;
elastic means fixed to said chassis and adjustably fixed to said first rod, said elastic means being adapted to elastically bias said first rod into a predetermined position relative to said elastic means;
an absorber element having an inelastically adjustable length,



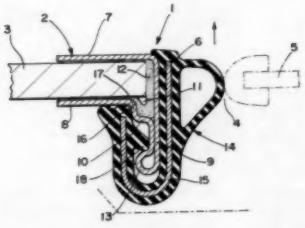
said absorber element having one end journalled to said lever and a second end journalled to one of said directional control valve and said chassis;
a hydraulic fluid pressure source connected to said control valve; and
a hydraulic fluid drain connected to said control valve,
wherein said control valve body is adapted to selectively connect one of said pressure source and fluid drain to said first hydraulic line.

4,418,956

EDGE TRIM AND WEATHER SEAL ASSEMBLY

Junji Yamamoto, Nogoya, and Shingo Harada, Yokosuka, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Kanto Jidosha Kogyo Kabushiki Kaisha, Yokosuka, both of, Japan

Filed Jan. 23, 1981, Ser. No. 227,932
Claims priority, application Japan, Jan. 24, 1980, 55-7792[U]
Int. Cl.³ B60J *7/00*
U.S. Cl. 296—216 **4 Claims**



1. An edge trim and weather seal assembly for a movable sun roof panel of a motor vehicle having a roof opening for receiving the panel, comprising:

(a) an edge strip adapted to be secured around the upper, lower and side edge portions of an edge of the sun roof panel using a bonding agent, said edge strip having upper and lower flanges for bonding to said upper and lower edge portions, respectively, said lower flange having a stepped portion defining a well for receiving excess bonding agent therein during mounting of said edge strip on said edge of the sun roof panel; and

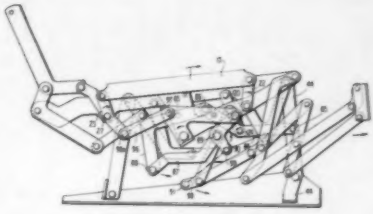
(b) a seal strip for mounting on said edge strip to form a weather seal with the roof opening when the panel is received therein, said seal strip having a locating edge portion for engagement with said stepped portion of said lower flange of said edge strip for resisting movement of said seal strip relative to said edge strip.

4,418,957

RECLINING CHAIR WITH IMPROVED ACTUATION

Walter C. Rogers, Jr., Denton, N.C., assignor to Parma Corporation, Denton, N.C.

Continuation-in-part of Ser. No. 199,595, Oct. 22, 1980. This application Aug. 13, 1981, Ser. No. 292,700
Int. Cl.³ A47C *1/02*
U.S. Cl. 297—85 **32 Claims**



1. In a wall-avoiding recliner chair having a fixed base, a seat and backrest mounted on the base, a footrest movable between retracted position adjacent the front of the seat and an extended position projected forwardly from the front of the seat; the improvement comprising in combination, a seat linkage mounting the seat relative to the base for movement in response to the weight of an occupant of the chair between a closed position wherein the footrest is retracted and a reclining position with the seat projected forwardly relative to the base and with the footrest extended, a footrest linkage mounting the footrest relative to the seat for movement between said positions thereof, linkage means interconnecting the footrest linkage and the seat linkage for actuating the footrest between extended and retracted positions in response to movement of the seat linkage caused by the weight of the chair occupant, lock means releasably holding the seat linkage in said closed position against movement into a reclining position under the weight of an occupant of the chair; and release means for releasing the lock mechanism to permit the seat linkage to move from said closed position to a reclining position, said release means including a release linkage mounting the seat relative to the seat linkage for movement relative thereto and being operatively connected to said lock means for releasing the same upon movement of said release linkage relative to the seat linkage from the position wherein the seat linkage is in said closed position.

4,418,958

PLASTICS CHAIR SHELL

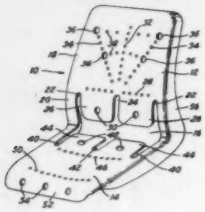
Bernard C. Watkin, 32 West Square, London SE11, England

Filed Jan. 21, 1981, Ser. No. 226,888
Claims priority, application United Kingdom, Jan. 21, 1980, 8001981
Int. Cl.³ A47C *7/02*
U.S. Cl. 297—457 **11 Claims**

1. A chair shell of resilient material comprising a back support and a seat, in which:

an aperture is formed in the chair shell at the junction of the back support and the seat, the opening extending almost to the lateral edges of the chair shell,
the back support has an upper portion and a lower portion,
the upper portion of the back support has zones of weakness arranged to modify the deformability of the back support so that when the back support is flexed under pressure from the back of a sitter the said upper part is deformed to a shape which is forwardly convex in vertical section and forwardly concave in horizontal section,

the lower portion of the back support is divided into two portions by a centrally disposed slit which extends upwards from the said aperture, the two portions being adapted to flex under pressure from the back of a sitter in such a manner that the lower edges of the said portions move backwards to increase the convexity of the back support in vertical section and the inner edges of the said portions move backwards to increase the concavity of the back support in horizontal section,



the said seat has a rear portion, a middle portion and a front portion,

said rear portion of the seat being constructed to be deformed resiliently backwards under pressure from the ischial tuberosities of the sitter,

said front portion of the seat being constructed to be resiliently deformed downwards under pressure from the under-thighs of the sitter.

4,418,959

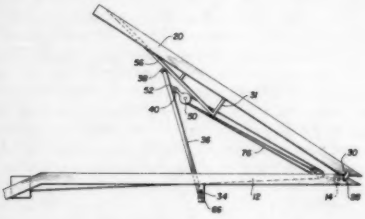
SCISSOR TAIL DUMP TRAILER APPARATUS

James G. Dunlap, 3533 SE. 143rd St., Portland, Oreg. 97236

Continuation-in-part of Ser. No. 155,017, May 30, 1980, abandoned. This application Feb. 19, 1982, Ser. No. 350,547

Int. Cl.³ B60P *1/04*

U.S. Cl. 298—19 V **8 Claims**



1. A scissor tail dump trailer apparatus comprising

a platform frame for a dump trailer of generally rectangular configuration and having a rear end portion and a front end portion,

a dumping bed frame disposed to generally overlie the platform frame and being of generally rectangular configuration also hving a rear end portion and a front end portion,

a pivot plate associated with and welded onto a portion of the rear end portion of the dumping bed frame, said pivot plate positioned at each side of the rear end portion of the platform frame for pivotably mounting said bed frame thereon,

a pair of inverted channel guides disposed in parallel on one end of the dumping bed frame and having a forward end mounted to the front end of the dumping bed frame and a rear end mounted to a cross support member of the dumping bed frame,

a pair of lifting arms disposed in parallel in the interior of the platform frame having rollers mounted on a forward end for engaging respective ones of the pair of inverted channel guides and a rear end being pivotally mounted on a fulcrum frame mounted to a cross support member of the platform frame,

a strut secured between said pair of lift members near the end of which said rollers are mounted, a support rod secured to said strut, said support rod including a hook member centrally secured to said strut intermediate of the pair of lifting arms for receiving a first hook means,

a first pulley block comprising a plurality of pulley wheels and said first hook disposed to engage the hook member,

a second pulley block including a plurality of pulley wheels and mounted centrally of the rear end portion of the platform frame from an eye bolt,

an electric winch generally centrally mounted forward and downwardly of the front end portion of the platform frame for receiving a cable means,

said second pulley block having means to secure an end of a cable means which in turn passes through one wheel of the first pulley block returning to one wheel of the second pulley block thence to another wheel of the first pulley block and returning to another wheel of the second pulley block, etc. thence to the electric winch.

4,418,960

MULTIPLE-BED SOLUTION MINING OF AN INCLINED STRUCTURE

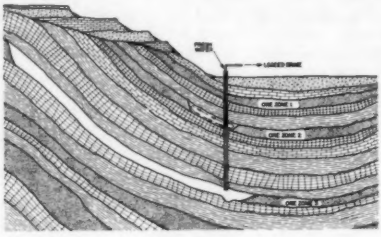
Rudolph S. Higgins, Moab, Utah, assignor to Texasgulf Inc., Stamford, Conn.

Filed Nov. 4, 1981, Ser. No. 318,102

The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.

Int. Cl.³ E21B *43/28*

U.S. Cl. 299—5 **5 Claims**



1. A method of solution mining multiple beds of an extractable ore disposed in sloping subterranean strata each disposed beneath an insoluble stratum which comprises the steps of:

(a) establishing a borehole communicating with said strata at a downdip location therein;

(b) commencing with the lowermost ore zone, injecting solvent into said borehole in such a manner that the solvent will be directed in an updip direction along the upper portion of said stratum to develop a cavity with mining face remote from said borehole;

(c) withdrawing solvent with dissolved ore through said borehole at an exit point disposed vertically downwardly from the entrance point at which the incoming solvent is discharged into the cavity from the borehole;

(d) adjusting such withdrawal to provide for downflow of the solvent across said mining face and downwardly in a downdip direction along the floor of said cavity to said exit point at a rate sufficient to extract said ore stratum without appreciable mining of vertically adjacent strata;

(e) after the lowermost ore zone is depleted of recoverable ore, the center extraction pipe is raised, the said borehole is plugged up to the next vertically disposed ore stratum of interest, the casing is perforated or cut away in the said next ore zone, the said extraction pipe is then lowered to

a level slightly below the said next ore zone to form a sump;

(f) the said next ore stratum is mined by developing a new cavity in said manner as heretofore described in Steps (b) through (d); and,

(d) each succeeding vertically disposed ore stratum of interest is mined in said manner as heretofore described in Steps (b) through (f).

4,418,961

METHOD FOR RESTORING CONTAMINANTS TO BASE LEVELS IN PREVIOUSLY LEACHED FORMATIONS

E. Thomas Strom, Dallas, and Wilton F. Espenscheid, DeSoto, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 221,726, Dec. 31, 1980, abandoned. This application May 27, 1982, Ser. No. 382,747

Int. Cl.³ E21B *43/28*

U.S. Cl. 299—5 **16 Claims**

15. A method for restoring to environmentally acceptable levels the soluble molybdenum values in a subterranean formation that has been subject to in situ oxidative leaching wherein said oxidative leaching is carried out in uranium-bearing formations containing little or no calcium carbonate minerals associated with said uranium, which process comprises:

introducing soluble calcium values into said leached formation.

4,418,962

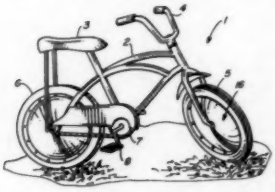
SPOKED WHEEL COVERS

Clarence S. Schaffer, Rte. 1, Box 696, Groveland, Fla. 32736

Filed Oct. 2, 1981, Ser. No. 307,730

Int. Cl.³ B60B *7/00*

U.S. Cl. 301—37 P **7 Claims**



1. A spoked wheel cover comprising in combination:

a pair of covers sized to cover each side of the spokes on a spoked wheel and having a center axle opening therein for an axle to extend through;

attachment means for attaching said covers together through said spokes, said attaching means having a plurality of fasteners extending through the spokes to attach one cover to the other, said attachment means including a plurality of snap fastener portions formed on the perimeter flange of one of said pair of covers and a plurality of mating snap portions formed on the other of said pair of covers perimeter flange, one of said pair of covers being formed of a molded polymer and the snap portions formed thereon being molded polymer male snap portions and the other of said pair of covers being formed of a molded polymer and the snap portions thereon being molded female snap portions; and

spacer means for spacing one cover from the other, said spacer means formed into the snap portions formed on one said covers, and one cover of said pair of covers having an opening for a valve stem extension to extend through and a bent valve extension to allow the extension to fit into the opening in said spoked wheel cover, whereby the spokes on a spoked wheel can be covered.

4,418,963

CONTROL SYSTEM FOR A VEHICULAR BRAKING SYSTEM INCORPORATING A HYDRODYNAMIC BRAKE AND A FRICTION BRAKE

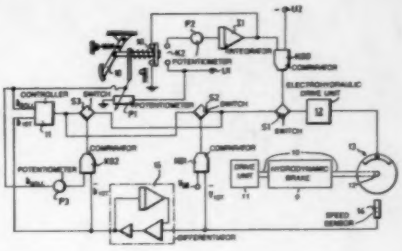
Volker Sprockhoff, Aachen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,122

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027746

Int. Cl.³ B60T *8/08*

U.S. Cl. 303—3 **13 Claims**



1. A control system for a vehicular braking system incorporating a hydrodynamic brake and a friction brake acting in parallel comprising:

first means responsive to movement of a brake pedal to provide a first signal indicating a total required braking torque, said total required braking torque being generated by said hydrodynamic brake with a first priority; and

an electronic closed loop having said friction brake therein, said closed loop controlling said friction brake to generate a braking torque equal to said total required braking torque and a braking torque generated by said hydrodynamic brake, said closed loop including

second means coupled to said first means and a third means providing a second signal representing an actual deceleration of a vehicle containing said braking system, said second means being responsive to said first and second signals to produce a third signal to control operation of said friction brake, and

three logic switches coupled between said second means and said friction brake, each of said three switches being controlled in response to a different one of brake actuation duration, vehicle speed and vehicle deceleration with that one of said three switches responsive to said brake actuating duration being connected to said friction brake and for a logical AND operation with each of the other two of said three switches connected to said second means to provide a logical OR operation.

4,418,964

BRAKING HYDRAULIC PRESSURE CONTROL VALVE IN A DUAL-CIRCUIT BRAKE SYSTEM

Masayoshi Katagiri; Yoshihisa Nomura, both of Toyota; Hiroshi Kawaguchi, Mishima; Shuho Nishina, Susono, and Eiji Miura, Kariya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Aichi, both of, Japan

Filed Oct. 30, 1981, Ser. No. 316,632

Claims priority, application Japan, Mar. 6, 1981, 56-31641[U]

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—6 C **15 Claims**

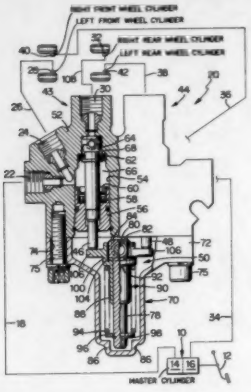
15. A device for biasing the projecting ends of a pair of valve pistons retained parallel to one another within a control valve housing, comprising:

means for providing a cover for enclosing the projecting ends of said valve pistons;

a guide member having first and second end portions and

pivotally coupled to said cover at said first end portion, said second end portion extending within said cover;

a sliding member slidably coupled for movement along said guide member and including a first end portion constructed to abut against the projecting ends of the valve pistons;



a spring coupled to the second end of said guide member and enclosed within said cover and positioned to abut against said sliding member in such manner as to provide a biasing force against the projecting ends of said valve pistons;

stopper means disposed within said cover for limiting the pivotal movement of said guide member to a predetermined range.

4,418,965

LOAD-CONTROLLED BRAKE PRESSURE CONTROL UNIT

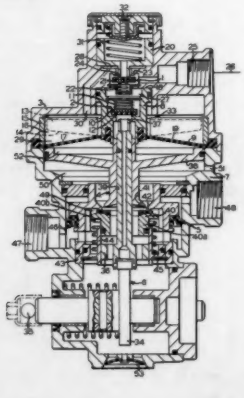
Erich Reinecke, Burgdorf, Fed. Rep. of Germany, assignor to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 26, 1981, Ser. No. 314,349

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3026252

Int. Cl.³ B60T *8/18*

U.S. Cl. 303—22 R **10 Claims**



1. A load-controlled brake pressure control unit for pneumatic trailer brake systems, comprising:

(a) a housing;

(b) a brake pressure control piston operably disposed in said housing;

(c) a brake pressure control valve having an intake valve and a discharge valve operable by said control piston;

(d) a dual valve member operably disposed in the brake pressure control piston and forming, along with a first valve seat located on the control piston, the intake valve;

(e) said dual valve member, in cooperation with a valve seat formed on an upper end of a tappet member, also forming the discharge valve, said tappet member having an axial passageway and being adjustable axially in relation to the vehicle weight, whereby the dual valve member is unseated from the first valve seat by said tappet member while simultaneously blocking the passageway;

(f) a relay valve operably disposed in said housing and cooperating with said brake pressure control valve for providing trailer brake-applying pressure via a supply valve;

(g) said relay valve being operated by a relay piston coaxially aligned with the control piston;

(h) said tappet member being slidably and sealingly reciprocable coaxially through the relay piston; and

(i) an emergency brake piston located in a lower housing section to serve as a valve seat for a discharge valve of the relay valve.

4,418,966

PUMP-LESS HYDRAULIC BRAKE SYSTEM FOR AUTOMOBILES

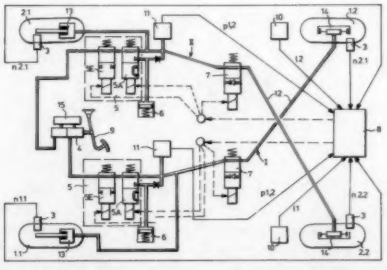
Peter Hattwig, Cremlingen, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Feb. 25, 1982, Ser. No. 352,169

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109372

Int. Cl.³ B60T *8/26, 8/02*

U.S. Cl. 303—100 **6 Claims**



1. A pump-less hydraulic brake system for vehicles having a pair of front wheels and a pair of rear wheels, and a pair of front wheel brakes and a pair of rear wheel brakes associated therewith, comprising:

(a) master brake cylinder means for providing pressurized brake fluid;

(b) a pair of independent brake lines, each connected to receive pressurized fluid from said master cylinder means, wherein each brake line is connected to deliver fluid to one front wheel brake and has a portion to deliver fluid to a diagonally opposed rear wheel brake;

(c) a control valve means disposed in each of said brake lines, wherein each said control valve means has an electrically connectable inlet valve and an electrically connectable outlet valve, and said inlet and outlet valves in each said control valve means are actuatable to one of a first combination, in which the fluid pressure in the respective brake line follows the pressure predetermined by the master brake cylinder, a second combination, in which the fluid

pressure in the respective brake line drops, and a third combination, in which the fluid pressure in the respective brake line remains at the pressure prevailing at the start of said third combination;

(d) a pair of electrically connectable rear brake inlet valves, one disposed in the portion of each brake line leading to its respective rear wheel brake, which when actuated limits the fluid pressure in the associated rear wheel brake to the pressure prevailing when actuated;

(e) means responsive to vehicle weight for controlling said rear brake inlet valves independent of other control commands to said rear brake inlet valves;

(f) sensor means associated with each wheel for detecting the respective wheel's rotational speed and angular deceleration; and

(g) control circuit means for receiving signals from each said sensor means and for selectively actuating the inlet and outlet valves of said control valve means and said rear brake inlet valves as a function of one of the magnitude of said signals and the ratio of said signals, wherein at any single time only one of the two control valve means is actuatable to said second combination.

4,418,967

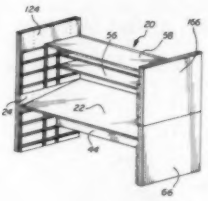
WAFFLE FURNITURE SYSTEM

Henry T. Winkelman, Jr., 7405 Maryland Ave., St. Louis, Mo. 63130, and Edward E. Huckaby, 9802 Westview, Houston, Tex. 77050

Filed Jul. 31, 1981, Ser. No. 289,124

Int. Cl.³ A47B *87/00*; F16B *12/00*

U.S. Cl. 312—107 **7 Claims**



1. A furniture system for assembly into various architectural office furniture components including desks, drafting tables, cubicles, stands, and crates, comprising

a plurality of longitudinally extended generally rectangular work panels for work surfaces, desk tops, panels, and structural members;

a plurality of end panels having means for receiving an edge of said work panels at a plurality of horizontally and vertically spaced apart places on said end panel whereby the end panels receive and maintain the work panels in a chosen, fixed, spatial relationship to the end panels, the relationship being changeable by engaging said work panels at different locations with said end panels; and wherein said means for receiving an edge of the work surfaces includes means for receiving an edge of the work surface adjacent an edge of said end panel;

a plurality of longitudinally extended shelf panels having ends formed for engagement with said receiving means in said end panels in a chosen spatial relationship to the work panels and end panels whereby said shelf panels are mountable with said end panels as a shelf or lateral brace;

means for fixing said work panels and said shelf panels to said end panels in a chosen spatial relationship, whereby said panels may be assembled into a variety of furniture components; and,

wherein the means for receiving an end of said work panels and said shelf panels comprises a plurality of spaced apart grooves formed in one side of said end panels for engaging the edge of said work panel and the end of said panel; and,

wherein said end panels have a plurality of holes formed therethrough for receiving bolts for connecting the end panels to the work panels and shelf panels, said holes in the end panels being located adjacent said grooves whereby a bolt through the hole may engage and retain a work panel or shelf panel in said groove; and,

wherein said shelf panels have at least one hole formed in the end thereof for receiving a bolt situated through said end panels when the shelf panel is engaged with the groove in said end panel and wherein the shelf panel has at least one second hole formed therethrough in the end thereof communicating with the hole formed through said end panel, and wherein the means for connecting said shelf panel to said end panel comprises at least one bolt through said end panel and through said hole formed in the end of said shelf panel and engaging a threaded body mounted in the second opening in said shelf panel.

4,418,968

FILING CABINET

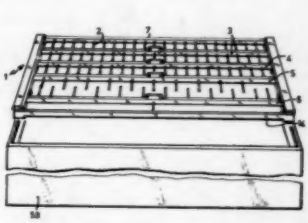
Gerhardus A. J. Vrielink, Santpoort, Netherlands, assignor to Handelmaatschappij Twentex B.V., Haarlem, Netherlands

Filed Dec. 24, 1980, Ser. No. 219,898

Claims priority, application Netherlands, Dec. 28, 1979, 7909347

Int. Cl.³ A47B *63/00, 95/02*; A42F *15/00*

U.S. Cl. 312—184 **9 Claims**



1. In apparatus for the suspension filing of sheet articles having peforations extending along their upper edges, a support frame having front and rear portions interconnected at their opposite ends by guide rails, a plurality of racks extending between and movably mounted on said guide rails, suspension carrier pins mounted on said racks positioned to engage the perforations in the articles to be filed, said carrier pins being oppositely directed and in staggered relationship to each other, adjacent racks being movable relative to each other from a closed position in which the said adjacent racks define a suspension compartment therebetween with their respective carrier pins extending across the suspension compartment to an intermediate position in which the carrier pins just overlap each other, and to an open position in which the carrier pins are spaced apart to permit removal of articles suspended on the pins, an actuating rod extending along the length of each rack, means mounting each of said actuating rods for movement in a plurality of directions, an operating handle connected to each actuating rod for moving said rod, and coupling means carried by each rack to detachably connect it to the next rearward rack, said coupling means being operatively connected to said actuating rods, whereby movement of said actuating rods in a first direction will actuate said coupling means to disengage a selected rack from the next adjacent rack, the improvement which comprises locking means carried by the frontmost rack for selectively locking the frontmost rack and any additional racks coupled thereto in either the open or intermediate positions, said locking means comprises at least one end cam mounted on said frame, a hook mounted on the actuating rod of said frontmost rack positioned to releasably engage said cam

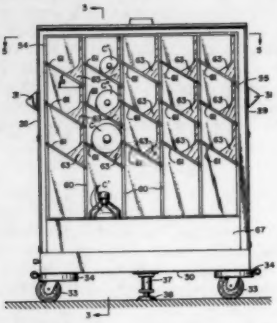
to lock said foremost rack in the open position, said hook being displaceable to release said foremost rack for rearward movement upon movement of said rod in a second direction.

4,418,969

BOTTLED CHEMICAL HANDLING SYSTEM

Kenneth R. Hettman, 833 Alpine Ave., Burlingame, Calif. 94010

Filed Dec. 24, 1980, Ser. No. 219,688
Int. Cl.³ A47B *73/00, 91/00*
U.S. Cl. 312—250 **14 Claims**



1. A bottle containment module comprising a top, a bottom, a back, and two sides;

a plurality of laterally spaced partitions vertically arranged within said module;

a plurality of shelves received between adjacent partitions and arranged at a first predetermined angle with respect to a plane parallel to said bottom and normal to said partitions so that a bottle placed on a shelf normally rests in two point line contact with the shelf and an adjacent partition, said shelves extending toward said back in a downwardly sloping manner at a second predetermined angle so that a bottle placed on a shelf normally rests at said second predetermined angle and is biassed backwardly and downwardly of said module by its own weight; and

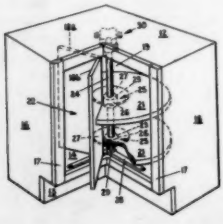
means providing a limit stop for bottles to be placed on said shelves.

4,418,970

ROTARY-POSITION CATCH FOR ROTATABLE SHELF UNITS

Marvin W. Hyder, Rockford, and Steven F. Weinstock, Ada, both of Mich., assignors to Leslie Metal Arts Company, Grand Rapids, Mich.

Filed Feb. 20, 1981, Ser. No. 236,158
Int. Cl.³ A47B *81/00;* **A47F** *3/10*
U.S. Cl. 312—305 **12 Claims**



1. A rotary-position catch for holding a shaft in a selected rotary position, the shaft being rotatable about an axis and supported by bearing means between two surfaces, the catch comprising:

a hollow prism element made of a flexible plastic material, being coaxial with the shaft and having at least one inwardly-extending dog on at least one side of the element, said at least one side flexing at adjacent corners of said prism element, the distance between the innermost point of the at least one dog and the axis of the prism element being less than the distance between the axis of the prism element and the remaining sides of the prism element;

an oblong element having at least one recess in a peripheral wall thereof at a major diameter of the oblong element, the distance between the axis of the shaft and the innermost point of the recess being about equal to the distance between the at least one dog of the prism element and the axis of the shaft,

the at least one recess being adapted to receive the at least one dog in an interference-type fit, the oblong element being concentrically disposed within the prism element,

one of the hollow prism elements and the oblong elements being mounted to one end of the shaft, the other of the hollow prism elements and the oblong elements being mounted to one of the surfaces adjacent the one end;

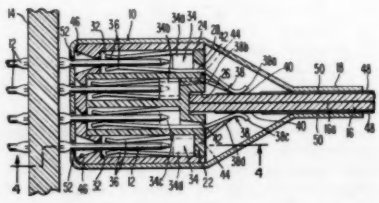
whereupon rotation of the shaft, the at least one dog is received in the at least one recess in an interferencetype fit so as to maintain the shaft in a selected rotary position.

4,418,971

ELECTRICAL KEYING ARRANGEMENT

Warren A. Liss, Aurora, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 3, 1981, Ser. No. 289,761
Int. Cl.³ H05K *1/02*
U.S. Cl. 339—17 L **11 Claims**



1. An electrical keying arrangement for preventing electrical arcing and related damage when a first and a second electrical component are interconnected, said first and second components being associated, comprising:

a first and a second keying terminal positioned on said first component;

a third and a fourth keying terminal positioned on said second component, said third and said fourth keying terminals corresponding respectively in position to said first and said second keying terminals;

switch means operative to interconnect said third and said fourth keying terminals only when said first and said second components are positioned in a predetermined manner to connect respectively said first and said second to said third and said fourth keying terminals; and

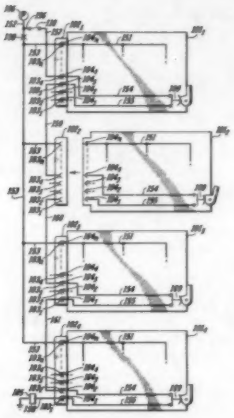
a conducting path including in sequence said first and said third keying terminals, said switch means, and said fourth and said second keying terminals and being completed when said components are positioned in said predetermined manner and when said switch means is operated to interconnect said third and said fourth keying terminals.

4,418,972

ELECTRICAL CONNECTOR FOR PRINTED WIRING BOARD

John E. Benasutti, North Wales, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 1, 1982, Ser. No. 344,490
Int. Cl.³ H01R 9/09
U.S. Cl. 339—14 R 5 Claims



1. An electrical connector for use with a printed wiring board which includes a pair of planar surfaces, a plurality of metallized pads disposed adjacent the edge of at least one of said pair of surfaces, and an integral ground conductor plane; said electrical connector comprising:

an inner and an outer member formed of electrically insulative material,

said inner member having a plurality of electrical contacts disposed respectively in said cells, each of said electrical contacts having an elongated tail section, each of said cells having a slot-like aperture in a rearward wall thereof for permitting the tail section of an electrical contact to protrude from said inner member, a longitudinal groove formed in said rearward wall of said inner member for receiving said edge of said printed wiring board, the elongated tail section of each of said contacts engaging one of said plurality of metallized pads of said printed wiring board and being affixed thereto,

said outer member being comprised of a box-like structure open on one side to receive said inner member and having on its opposite side, a plurality of terminal-receiving apertures homologously positioned with respect to said cells in said inner member,

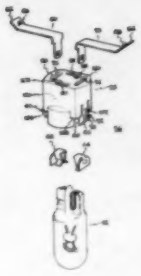
means for fastening said connector to said printed wiring board comprising a ground conductor plane in the form of a metallic shell substantially enclosing said outer member and having a plurality of openings in alignment with said terminal-receiving apertures of said outer member, said metallic shell having a pair of coextensive extremities, said coextensive extremities being affixed to said printed wiring board by at least one metallic fastener, said fastener contacting said ground conductor plane of said printed wiring board, thereby electrically connecting the ground conductor planes of said connector and said printed wiring board.

4,418,973

WEDGE BASE LAMP SOCKET ASSEMBLY

Andrew Smetana, Mentor, and James M. Hanson, Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,388
Int. Cl.³ H01R 13/74
U.S. Cl. 339—31 L 3 Claims



1. In a lamp socket for a wedge base incandescent lamp comprising a cylindrical shape plastic body member with a hollow cavity opening at one end into which the lamp is inserted for frictional engagement with a pair of connector elements located at the bottom of said hollow cavity, a first and second pair of slots located in opposing relationship at the other end of said plastic body member, only said first pair of slots communicating with said connector elements but with said second pair of slots being electrically connected to said connector elements with external electrical elements, and electrically conductive metal terminals which are pressed into the slots for electrical contact with said connector elements, the improvements which further include a pair of opposing resilient fingers being integrally formed in the open end of the plastic body member to physically engage external lamp support means and larger size openings at one end of each slot to accommodate external electrical elements frictionally engaged in said larger size openings for electrical contact with the connector elements.

4,418,974

LOW INSERTION FORCE SOCKET ASSEMBLY

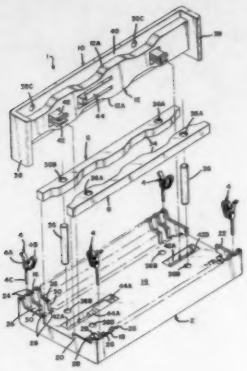
Alan R. MacDougall, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 229,044, Jan. 28, 1981, Pat. No. 4,377,319. This application Jun. 22, 1981, Ser. No. 276,423
Int. Cl.³ H01R 13/631
U.S. Cl. 339—75 M 4 Claims

1. A low insertion force socket assembly having a base, contact receiving cavities in the base along sides of the base, an electrical contact in each of the cavities, each of the contacts having a pair of opposed fingers spaced apart for receiving therebetween an electrical terminal, and the fingers of each of the contacts engaging opposite sides of a respective terminal upon resilient deflection of one resilient finger of each contact toward the other finger of the contact, characterized in that;

a pair of elongate rails are mounted on the base alongside the resilient fingers of respective contacts, each rail having an elongate sinuous follower surface, a cover overlying the rails, a cam on the cover being interposed between the rails, the cam having sinuous edges facing the sinuous follower surfaces of the rails, so that reciprocation of the cam together with the cover causes the sinuous edges of the cam slidably to traverse against the sinuous follower surfaces of the rails, and the rails to deflect the resilient fingers of the contacts toward the opposed fingers; the

base including an elongate slot and the cover including a projecting resilient latch hooked in the slot, for reciprocal



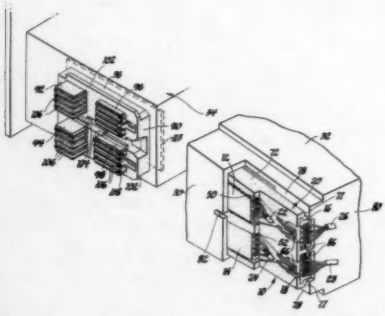
sliding movement along the slot during reciprocation of the cam together with the cover to secure the cover to the base.

4,418,975

ELECTRICAL CONNECTOR FOR A SLIDE-IN COMPONENT

John J. O'Keefe, II, Cortland, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1981, Ser. No. 294,212
Int. Cl.³ H01R *13/54*
U.S. Cl. 339—91 R **3 Claims**



1. An electrical connector for connecting a slide-in component to a plurality of related, remotely located components by a plurality of wiring harnesses comprising;

a terminal block mounted on a side of the slide-in component, said terminal block having a plurality of longitudinally spaced rows of terminal pads with each of the terminal pads being laterally offset from a longitudinally aligned terminal pad in another row, a receptacle for slideably receiving the slide-in component,

a plurality of connector blocks attached to respective ones of a plurality of wiring harnesses, and

means for arranging the connector blocks on a side wall of the receptacle in a plurality of longitudinally spaced rows with each of the connector blocks in one row being laterally offset from a longitudinally aligned connector block in another row, and

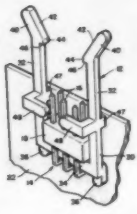
said terminal pads and said connector blocks each having a plurality of terminals which engage terminals of the other when the slide-in component is mounted in the receptacle.

4,418,976

RETAINING CLIP FOR AN ELECTRICAL CONNECTOR

Albert A. Lenzini, Mundelein; Robert C. Swanson; James T. Roberts, both of Chicago, and John A. Pruski, Schiller Park, all of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Oct. 16, 1981, Ser. No. 311,851
Int. Cl.³ H01R *13/627*
U.S. Cl. 339—91 R **6 Claims**



1. A retaining clip (12) for releasably maintaining a socket (24) in engagement with a plug (14) securely soldered to a circuit board (22), the plug (14) comprises at least two spaced pins (16) maintained in relative position by a molded strip (18), the pins (16) are bent and soldered to the circuit board (22) so that the free ends thereof extend along a plane generally parallel to the circuit board (22), said retaining clip (12) comprising:

a generally "U" shaped body member (30) formed of resilient insulating material and including a pair of extending legs (32) and a base (34), the base (34) of said body member (30) being sized to fit between the spaced pins (16) of the plug (14) prior to connection of the plug (14) to the circuit board (22), the legs (32) of the body member (30) define means (44) thereon for grasping the socket (24) thus securely retaining the socket (24) within the legs (32) of said "U" shaped member (30),

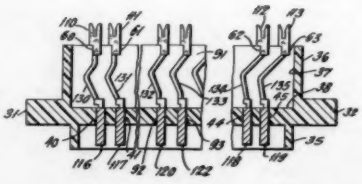
and alignment means (48) secured to and extending from said legs (32) toward each other for preventing misalignment between the plug (14) and the socket (24), said alignment means (48), said legs (32) and the circuit board (22) defining an access opening for accurately directing the socket (24) and plug (14) into engagement.

4,418,977

CONNECTOR STRUCTURE FOR FLAT CABLE

William F. O'Shea, Jr., Hatfield, Pa., assignor to Continental-Wirt Electronics Corporation, Warminster, Pa.

Filed Oct. 16, 1978, Ser. No. 951,746
Int. Cl.³ H01R *13/38*
U.S. Cl. 339—99 R **10 Claims**



1. A cable connector for flat cable, comprising:

a molded insulation material base having a rectangular well formed therein and at least one upstanding wall;

a plurality of equispaced openings formed in and extending

through the bottom of said rectangular well, each of said openings being formed along a straight line;

a plurality of equispaced contact receiving slots, equal in number to the number of said equispaced openings, formed in said upstanding wall, each of said slots being formed along a line parallel to said straight line and associated with a respective one of said openings, the distance between said slots being different than the distance between said openings;

a plurality of identical contacts, equal in number to the number of equispaced openings, each of said contacts having a contact nose end, a contact piercing tail end and a connector section connecting said nose end to said tail end, each of said connector sections being prebent at a central location between their ends and easily bendable in a direction parallel to said straight line, said nose end of each of said contacts being fitted through a respective one of said openings, said tail end of each of said contacts being received in that one of said slots which is associated with that one of said openings through which its tail end is fitted whereby at least one of said connector sections is bent by a different amount than at least one other said connector section, the outer ends of each of said tail ends lying in a first flat common plane and the outer ends of said contact noses lying in a second flat common plane which is spaced from and parallel to said first common plane; and

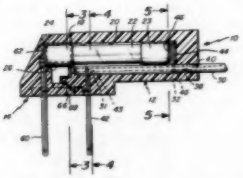
a plurality of ribs formed integrally with said at least one upstanding wall and disposed in such a manner that a respective pair of said ribs is located on either side of each of said openings, each of said contacts including portions which are received between and guided by that respective pair of ribs which is located on either side of that said opening through which said nose end of said contact is fitted.

4,418,978

FUSE PLUG

Amos Shamir, Brooklyn, N.Y., assignor to Paramount Die & Machine Products, Brooklyn, N.Y.

Continuation of Ser. No. 200,456, Oct. 24, 1980, abandoned.
This application Jun. 3, 1982, Ser. No. 384,615
Int. Cl.³ H01R *13/36*
U.S. Cl. 339—99 R **13 Claims**



1. A combination plug and fuse holder adapted for receiving a multi-conductor cord and comprising;

a first insulated housing member having a passage for receiving the electric cord and a pocket extending substantially parallel to the passage and adapted to receive a fuse,

contact means for electrically coupling one conductor of the cord to one side of the fuse,

first prong means supported in said first insulated housing member for electrical coupling to the other conductor of the cord,

a second insulated housing member including means for permitting the separation apart of the first and second housing members and for further interlocking these members,

and a second prong means supported in the second insulated housing member extending in parallel with the first prong means but only in the interlocked position of the housing members,

said second prong means for electrical coupling to the other side of the fuse,

said first insulated housing member comprising a base member and a body member, and means for relativly hinging the base and body members with the pocket and passage defined therebetween,

means for hinging said second housing member from said base member at the end thereof,

said hinging means between the base member and body member, and said hinging means between the base member and second housing member being disposed, respectively, along different sides of the base member,

said second insulated housing supporting only the second of the first and second prong means, and the body member supporting only the first of the first and second prong means,

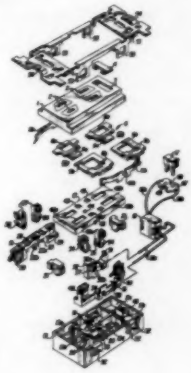
said second insulated housing and body member having one of two alternate positions relative to said base member including an interlocked position in which the first and second prong means extend in parallel and an open position in which the second insulated housing and body member are hinged away from the base member displacing the second prong means out of parallel with the first prong means and permitting access to the fuse to enable removal thereof.

4,418,979

PLUG SOCKET WITH WORKING CONDITION DISPLAY

Kiyoshi Takashima, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jan. 15, 1982, Ser. No. 339,721
Claims priority, application Japan, Jan. 21, 1981, 56-8272
Int. Cl.³ H01R *3/00*
U.S. Cl. 339—113 L **2 Claims**



1. A plug socket with working condition display comprising:

a main body, divided into first, second and third compartments, said compartments arranged in the shape of a U, said second and third compartments being connected by a cut-out;

a first blade clip spring member placed in said first compartment, said first blade clip spring member including a terminal and a contact member;

a second blade clip spring member placed in said second compartment, said second blade clip spring member including a contact member;

a terminal associated with but separate from said second blade clip member;

a current transformer placed in said thid compartment and having primary and secondary leads;

an electrically luminous element connected to the secondary leads of said current transformer;

one of said primary leads of said current transformer being connected to said terminal associated with but separate from said second blade clip member;

the other of said primary leads of said current transformer being connected to the contact of said second blade clip member;

both of said primary leads passing through said cutout;

a lid plate engageable with said main body to form a casing, said lid plate including a pair of plug blade insertion slits complementary to said first and second blade clip spring members and a light transmitting portion designed to permit the transmission of light from said electrically luminous element,

whereby said plug socket will visually indicate the working condition of a load connected to said plug socket.

4,418,980

PLANAR WAVEGUIDE LENS, ITS UTILIZATION AND METHOD FOR ITS MANUFACTURE

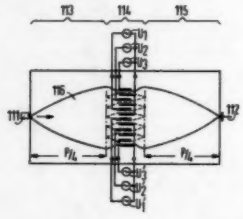
Rudolf Keil, Munich; Franz Auracher, Baierbrunn, and Michael Stockmann, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,558

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023147

Int. Cl.³ G02B *5/174*

U.S. Cl. 350—96.13 **17 Claims**



11. A planar waveguide lens signal recognition device, comprising:

an optical waveguide layer including a longitudinal axis, an approximately parabolic refractive index profile extending transversely of the axis, an input side comprising an input end including an input location for receiving light, and an output side comprising an output end including an output location for emitting light;

a central section between said input and output sides;

a plurality of tapered transitions connecting said central section to said input and output sides;

2×N strip waveguides carried on said central section and having 1–N and 1′–N′ electrodes, the 1′–N′ electrodes to receive an unknown frequency signal to cause respective phase shifts of the light of the respective strip waveguides and the 1–N electrodes to sequentially receive known reference frequency signals to cause respective phase shifts, so that the intensity of light output at said output location indicates the frequency of the unknown signal.

4,418,981

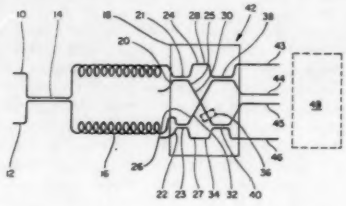
QUADRATURE FIBER-OPTIC INTERFEROMETER MATRIX

David W. Stowe, Buffalo Grove, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 19, 1982, Ser. No. 340,672

Int. Cl.³ G01B *9/02*

U.S. Cl. 350—96.15 **19 Claims**



8. An optical interferometer matrix including:

first and second waveguides, each having first and second optical signals, respectively, transmitted therethrough, said first signal in said first waveguide being a reference signal, said second signal in said second waveguide differing from said first signal by an optical alteration of the phase of said second signal which is desired to be monitored;

a housing encasing a portion of said first and second waveguides;

a third waveguide coupled to said first waveguide within said housing at a first preinterferometer coupling location to couple a portion of said first signal into said third waveguide to generate a third signal in said third waveguide differing in phase from said first signal by $\pi/2$ radians just beyond said first preinterfermoeter coupling location;

a fourth waveguide likewise coupled to said second waveguide within said housing at a second preinterferometer coupling location to couple a portion of said second signal into said fourth waveguide to generate a fourth signal differing in phase from said second signal by $\pi/2$ radians just beyond said second preinterferometer coupling location;

a first preinterferometer having one of said odd-numbered and one of said even-numbered waveguides coupled at a first interferometer coupling location to couple signals from said odd-numbered and even-numbered waveguides to one another; and

a second interferometer having the remaining one of said odd-numbered and even-numbered waveguides coupled at a second interferometer coupling location to couple signals from said remaining odd-numbered and even-numbered waveguides, said interferometer coupling locations being positioned within said housing so that corresponding interference components of the outputs from said first and second interferometers have a phase difference of approximately $\pi/2$ radians from one another.

4,418,982

SPLICE ORGANIZER

Gary S. Williams, Vancouver, Canada, assignor to Phillips Cables Ltd., Ontario, Canada

Filed Feb. 17, 1981, Ser. No. 235,235

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.20 **7 Claims**

1. A splice holder comprising:

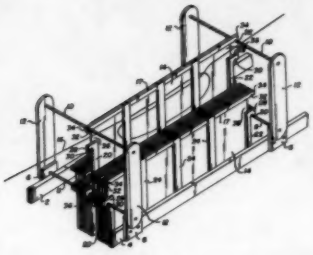
a chassis defined by side members spaced from each other, first cross members raised above the side members and spaced from each other and second cross members positionable above the first cross members;

a plurality of plates to be received between the side members

of the chassis and to receive a length of fibre containing a splice;

retaining means associated with each plate to hold a length of spliced fibre against the plate;

first suspension means at each end of each plate so a plate may be suspended from the first cross members of the chassis to lie substantially vertically in a first position;



second suspension means at each end of each plate so each plate can be suspended from the second cross members to lie substantially vertically in a second position, above the first position;

a raised periphery for each plate to protect a length of fibre held against the plate by the retaining means; and

at least one break in the periphery to permit the fibre to pass through the periphery.

4,418,983

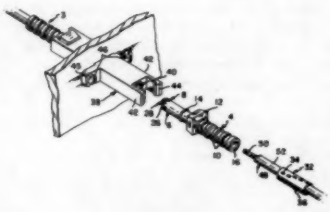
OPTICAL WAVEGUIDE CONNECTOR

Terry P. Bowen, Etters; Bernard G. Caron, Harrisburg; Douglas W. Glover, Harrisburg, and John C. Hoffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 16, 1981, Ser. No. 244,526

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.21 **12 Claims**



1. A connector for axially aligning a pair of optical waveguides of the type having a waveguide fiber and an outer jacket layer, comprising:

a receptacle body having a bore extending therethrough;

a pair of plug members for opposed positionment within said receptacle bore, each having an axial passageway adapted to receive one said fiber therein, and a forward alignment nose portion having a profiled opening therethrough communicating with said axial passageway, said opening being defined by upper and lower V-shaped surfaces separated by a transverse slot extending through said nose portion, and said upper and lower surfaces receiving a forward length of the waveguide fiber therebetween;

each said plug member having a rearward portion, and at least two compressible protrusions on said alignment nose portion for engaging said receptacle body to radially influence said upper and lower V-shaped surfaces against said waveguide fiber, and each said plug having an annular flange axially spaced a distance rearward of said protrusions for engaging said receptacle body;

a pair of retention sleeves, each positioned within said rearward passageway portion of a respective said plug member and receiving said optical waveguide therethrough, each said retention sleeve having a plurality of resilient outward tine projections biased outward and rearward from said sleeve engaging said respective plug member to inhibit rearward withdrawal of said sleeve from said plug member, and each said sleeve having a plurality of resilient inward tine projections biased inward and forward of said sleeve, and engaging the jacket layer of said optical waveguide to inhibit rearward withdrawal of said waveguide from said sleeve.

4,418,984

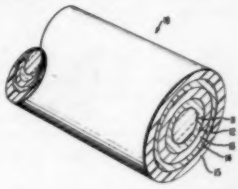
MULTIPLY COATED METALLIC CLAD FIBER OPTICAL WAVEGUIDE

Joseph A. Wysocki, Oxnard; George R. Blair, Culver City, and Michael R. Vince, Pollock Pines, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Nov. 3, 1980, Ser. No. 203,762

Int. Cl.³ G02B *1/10, 5/14, 5/172*; C03C *25/04*

U.S. Cl. 350—96.33 **35 Claims**



1. A flexible fiber optical waveguide for the transmission of optical electromagnetic radiation, said waveguide comprising a glass fiber including a glass core member having a first minimum refractive index for said radiation and a glass cladding concentrically surrounding said core, said glass cladding including at least one layer having a second refractive index for said radiation which is lower than the minimum of said first refractive index by at least 0.1% to produce total internal refraction of said optical radiation at the core/clad interface and to thereby guide said optical radiation along said waveguide, characterized in that said waveguide is provided with at least two metallic claddings with a first metallic cladding in contact with said glass fiber, said first metallic cladding comprising a metal or alloy which is substantially chemically inert with respect to the material comprising the glass fiber at the deposition temperature during coating of said metal or alloy onto said glass fiber, and at least one of said metallic claddings comprising a metal or alloy having a recrystallization temperature greater than room temperature or the anticipated use temperature, whichever is greater.

4,418,985

MULTI-COMPONENT GLASS OPTICAL FIBER FOR OPTICAL COMMUNICATION

Mitsu Kasori, Kawasaki; Takeshi Takano, Samukawa; Hironori Maki, Kawasaki, and Naohiko Ogino, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 26, 1982, Ser. No. 382,286

Claims priority, application Japan, May 30, 1981, 56-83498

Int. Cl.³ C03C *3/08, 13/00*; G02B *5/14*

U.S. Cl. 350—96.34 **6 Claims**

1. A multi-component system glass fiber for optical communication which comprises:

a core of a multi-component system glass having a composition consisting essentially of 35 to 45% by weight of SiO_2,

35 to 45% by weight of BaO, 3 to 7% by weight of Al_2O_3, 9 to 13% by weight of B_2O_3, 1.2 to 4% by weight of at least one alkali metal oxide selected from the group consisting of Na_2O, K_2O and Li_2O, the content of Na_2O being 2.5% by weight or less, and 4 to 11% by weight of at least one alkaline earth metal oxide selected from the group consisting of MgO and CaO; and

a clad layer, on said core, of a multi-component system glass having a composition consisting essentially of 66 to 71% by weight of SiO_2, 4 to 7% by weight of Al_2O_3, 7 to 12% by weight of B_2O_3, 12 to 16% by weight of at least one alkali metal oxide selected from the group consisting of Na_2O, K_2O and Li_2O, 2% by weight or less of at least one alkaline earth metal oxide selected from the group consisting of MgO and CaO, and 3% by weight or less of at least one of ZnO, ZrO_2 and TiO_2.

4,418,986

REAR PROJECTION SCREEN

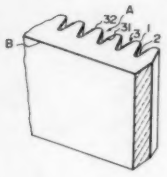
Yukio Yata, Chiba, and Koichi Inagaki, Hoya, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan

Filed Mar. 31, 1982, Ser. No. 364,193

Claims priority, application Japan, Apr. 7, 1981, 56-51194; Jun. 12, 1981, 56-90544

Int. Cl.³ G03B *21/60*

U.S. Cl. 350—128 **15 Claims**



1. A rear projection screen having a viewing side surface, a projection side surface and a medium therebetween and having a plurality of lenticules which are formed on said viewing side surface so as to form a lenticulated surface thereon, said each lenticule comprising a crest and trough portions interconnected by flank portions wherein at least a portion of each flank has a total reflection surface so that all light rays impinging on said flank are reflected by said total reflection surface and emanate through said medium at portions other than said flank portions.

4,418,987

POLARIZER ARRANGEMENT FOR A SIGNIFICANT IMPROVEMENT IN VIEWING ANGLE CHARACTERISTIC IN A LIQUID CRYSTAL DISPLAY

Hiroshi Takanashi, Yamatokoriyama, and Shoichiro Takahara, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 19, 1980, Ser. No. 179,501

Claims priority, application Japan, Aug. 21, 1979, 54-106941

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—337 **5 Claims**

1. A twisted nematic field effect mode liquid crystal display cell comprising:

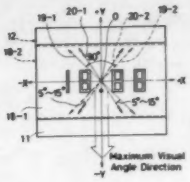
a liquid crystal layer;

first and second substrates on opposite sides of said liquid crystal layer;

first and second polarizers attached to respective outer surfaces of said first and second substrates, said polarizers having first and second planes of polarization;

first and second orientation films formed on respective inner surfaces of said first and second substrates for orienting molecules of said liquid crystal layer in first and second orientation directions;

wherein each of said planes of polarization is rotated with respect to one of said first and second orientation directions forming angles therebetween, said angles being



greater than or less than zero degrees and greater than or less than 90 degrees.

4,418,988

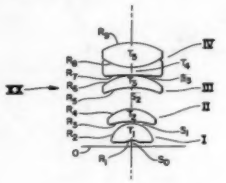
MICROSCOPE OBJECTIVE

Milton H. Sussman, Amherst, N.Y., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

Filed Feb. 19, 1981, Ser. No. 235,786

Int. Cl.³ G02B *21/02*

U.S. Cl. 350—414 **2 Claims**



1. A microscope objective having an NA of 0.66 consisting essentially of a concavo-hemispherical positive singlet I, a concavo-convex positive singlet II, a concavo-convex positive singlet III and a concavo-convex positive doublet IV wherein the parameters of the respective axial spacings (S_0-S_3) in mm, radii (R_1-R_9), in mm, with a minus sign (−) indicating a center of curvature on the object side of the lens, thickness (T_1-T_5) in mm, indices of refraction (ND_1-ND_5) and Abbe numbers ($\nu_1-\nu_5$) are determined by the following table:

Lens	Radius (R)	Thickness (T)	Spacing (S)	Refractive Index (ND)	Abbe No (ν)
			$S_0 = 0.105f$		
	$R_1 = -0.473f$				
I		$T_1 = 0.493f$		$1.78 < ND_1 < 1.79$	$50 < \nu_1 < 51$
	$R_2 = -0.595f$				
			$S_1 = 0.012f$		
	$R_3 = -1.782f$				
II		$T_2 = 0.329f$		$1.78 < ND_2 < 1.79$	$50 < \nu_2 < 51$
	$R_4 = -0.897f$				
			$S_2 = 0.627f$		
	$R_5 = -2.199f$				
III		$T_3 = 0.329f$		$1.615 < ND_3 < 1.65$	$60 < \nu_3 < 61$
	$R_6 = -1.239f$				

-continued

Lens	Radius (R)	Thickness (T)	Spacing (S)	Refractive Index (ND)	Abbe No (ν)
			S_3 = 0.014f		
	R_7 = −21.960f				
		T_4 = 0.219f		1.75 < ND_4 < 1.76	31 < ν_4 < 32
IV	R_8 = 1.385f				
		T_5 = 0.697f		1.49 < ND_5 < 1.50	81 < ν_5 < 82
	R_9 = −1.797f				

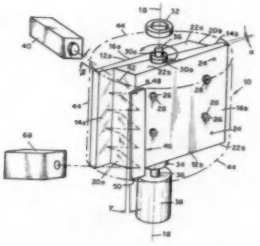
wherein f is 3.5 to 5.5 mm.

4,418,989

APPARATUS FOR SHIFTING THE WAVELENGTH OF LIGHT

William H. McCulla, Oak Ridge, and John D. Allen, Jr., Knoxville, both of Tenn., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jan. 29, 1982, Ser. No. 343,802
Int. Cl.³ G02B *5/12, 7/18, 27/00*
U.S. Cl. 350—486 **8 Claims**



1. Apparatus for shifting the wavelength of light, comprising:

a first reflector mounted for rotation about an axis and comprising at least one retroreflection corner having two planar reflecting surfaces disposed substantially perpendicular to each other and extending longitudinally of said axis in spaced relation therewith;

means for rotating said first reflector about said axis;

means for projecting a light beam along a path generally tangent to the cylinder of revolution generated by said first reflector as it rotates; and

a second reflector positioned outside said cylinder of revolution and having a planar reflecting surface oriented relative to said projecting means and said first reflector so that said light beam is repetitively reflected back and forth between said reflecting surface of said second reflector and said reflecting surfaces of said first reflector during a portion of each rotation of said first reflector, said light beam advancing along said reflecting surfaces longitudinally of said axis as it is reflected therebetween.

4,418,990

EYEGLASSES AND OTHER LENSES OF VARIABLE FOCAL LENGTH AND MEANS AND METHOD FOR VARYING SUCH FOCAL LENGTH

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific, Inc., South Windsor, Conn.

Filed Jul. 20, 1981, Ser. No. 284,782
Int. Cl.³ G02C *1/00*
U.S. Cl. 351—41 **9 Claims**

1. A variable focal length lens assembly comprising:

a lens having two lens surfaces and a circumferential marginal portion, said lens consisting of a unitary body of resiliently deformable light conducting material so that the curvature of said two lens surfaces may be varied by varying a pressure applied to said lens along said marginal portion,

a holder substantially surrounding said lens and engaging said marginal portion thereof so as to apply such a pressure to said lens,

means for adjusting said holder to vary said pressure which it applies to said lens, and

a range finder attached to said lens holder, said range finder including

a signal emitter for projecting a distance sensing signal generally along a line toward an object to be brought into focus,

a signal receiver for receiving a portion of said projected signal reflected from said object,

a detector associated with said signal emitter and said signal receiver for producing a distance signal related to the distance between them and said object, and

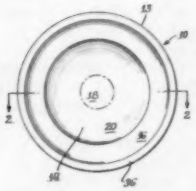
means for adjusting said holder to vary said pressure which it applies to said lens in response to said distance signal.

4,418,991

PRESBYOPIC CONTACT LENS

Joseph L. Breger, 511 Ravine Dr., Highland Park, Ill. 60035

Continuation-in-part of Ser. No. 78,462, Sep. 24, 1979, abandoned. This application Jun. 9, 1980, Ser. No. 157,399
Int. Cl.³ G02C *7/04, 7/06*
U.S. Cl. 351—161 **6 Claims**



1. A contact lens for correction of presbyopia having

a generally spherical anterior surface; and

a posterior side including an annular spherical surface which is an outer residual portion of a spherical base curve generally matched in radius of curvature to a portion of the cornea over which said spherical surface lies and a central generated aspherical surface extending from the center of said posterior side substantially beyond the diameter of the pupil,

said generated surface being generated into said base curve

by a continuous operation beginning at the center of the original base curve removing continuously less material from the center outward,

said generated surface having a central portion which optically cooperates with said anterior surface to provide an appropriate diopter correction for distance vision; and

a paracentral portion of said generated aspherical surface around said central portion having progressively increasing radii of curvature and decreasing eccentricities away from the center, said paracentral portion cooperating with said anterior surface to provide a gradient of appropriate diopter add for close-in and intermediate viewing;

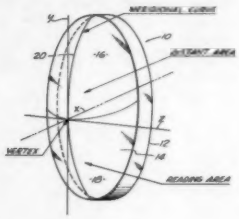
said annular spherical surface and a portion of said generated polished surface beyond said paracentral portion fitting closely adjacent the cornea.

4,418,992

OPHTHALMIC PROGRESSIVE POWER LENS AND METHOD OF MAKING SAME

Lawrence J. Davenport, deceased, late of Los Angeles, Calif., and Nancy Davenport, executrix, Downey, Calif., assignors to Younger Manufacturing Company, Los Angeles, Calif.

Filed May 17, 1982, Ser. No. 378,528
Int. Cl.³ G02C 7/06
U.S. Cl. 351—169 **7 Claims**



1. A method of making an improved ophthalmic lens having an x, y and z axis with progressive varying focal length characterized by having two refractive surfaces, one of which is divided into first, second, and third viewing zones intended respectively for distant vision, intermediate vision and near vision said one surface including a meridional curve passing through the optical center of the lens and traversing said zones, said meridional curve being defined by a sequence of points on said one surface, said first and third zones being either spherical, or being aspheric surfaces of revolution, the improvement consisting of a method of generating said second viewing zone which is the progressively powered surface interconnecting said first and third zones, said method comprising the steps of:

(a) defining the desired contour of the meridional curve;

(b) dividing the area on a first side of said meridional curve by two planes disposed perpendicularly to the y−z plane of the lens and containing the x axis thereof; and

(c) defining the progressive lens surface by a method including the steps of:

(1) defining the angle U as

$$U=(T-Ao+A1)/2$$

where T is the angle variable with the values of 0 to Ao for the distance portion of the lens; Ao to A1 for the intermediate portion of the lens; and A1 to for the near portion of the lens;

it is to be noted that the radius vector from the origin (x,o,o) and the angle T define the contour in the plane x, where x is the sag of the curve and is constant for each contour, the radius being a function of the angle T;

(2) expressing the radius R as a power series as follows:

$$R=G_o+G_1U+G_2U^2+G_3U^3+G_4U^4$$

and expressing the first and second derivatives with respect to T and also U thusly:

$$dR/dT+dR/du=G_1+2G_2U+3G_3U^2+4G_4U^3$$

and

$$d^2R/dT^2=d^2R/du^2=2G_2+6G_3U+12G_4U^2;$$

(3) establishing boundary conditions as follows:

(a) At T=A$_o$, with the radius of the distant viewing curve being RO:

$$RO=G_o+G_1U+G_2U^2+G_3U^3+G_4U^4;$$

(b) At T=A1, with the radius of the near viewing circle being R1:

$$R1=G_o+G_1U+G_2U^2+G_3U^3+G_4U^4;$$

(c) At T=AO, the radius change with angle=0: (arcs tangent at Ao)

$$dR/dU=0=G_1+2G_2U+3G_3O^2+4G_4U^3;$$

(d) At T=A1, the radius change with angle in finite: (arcs tangent at A1)

$$dR/dU=D1=G_1+2G_2U+3G_3O^2+4G_4U^3; \text{ and}$$

(e) At R=A1 the second derivative dR^2/dU^2 is finite: (arcs curvature of A1)

$$d^2R/dU^2=D2=2G_2+6G_3U+12G_4O^2;$$

(4) solving for G$_o$ through G$_4$ as follows:

$$G_3=\frac{1}{40^2}\left(D1-\frac{RO-R1}{U}\right)$$

$$G_1=\frac{D1}{2}-3(G3)U^2$$

$$G_4=\frac{D1}{4U^3}+\frac{D2}{8U^2}-\frac{3(Ro-R1)}{16U^4}$$

$$G_2=-\frac{D9}{4}-\frac{3D1}{4U}+\frac{3(RO-R1)}{8U^2}$$

$$G_o=RO-F1U-G2U^2-G3U^3-G4U^4; \text{ and}$$

(5) solving for D1 and D2 as follows:

(a) letting ys=radius position of the center of the near circular arc from (x,o,o) in the y,z plane;

(b) letting R3=circular radius of the near circular arc in the y−z plane;

$$\text{then } D1=-Y5\,\text{Sin}T-\frac{(\text{Sin}T\,\text{Cos}T)Y5)^2}{(R_3{}^2-(\text{Sin}T)^2(Y5)^2)^{1/2}}; \text{ and} \quad (c)$$

$$D2=-Y5\,\text{Cos}T-\frac{(Y5)^2(1-2\text{Sin}^2T)}{((R3)^2-(\text{Sin}T)^2(Y5)^2)^{1/2}}-\frac{(Y5)^4(\text{Sin}T)^2(\text{Cos}T)^2}{((R3)^2-(\text{Sin}T)^2(Y5)^2)^{3/2}}; \quad (d)$$

where the near circular section is defined as:

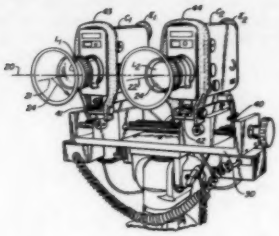
$$(Y-Y5)^2+Z^2=(R3)^2.$$

4,418,993

STEREOSCOPIC ZOOM LENS SYSTEM FOR THREE-DIMENSIONAL MOTION PICTURES AND TELEVISION

Lenny Lipton, Point Richmond, Calif., assignor to Stereographics Corp., San Rafael, Calif.

Filed May 7, 1981, Ser. No. 261,302
Int. Cl.³ G03B *35/00*
U.S. Cl. 352—57 **26 Claims**



1. A process for taking stereoscopic zoom three-dimensional pictures comprising the steps of providing first and second cameras spaced a predetermined distance apart for photographing the same scene; mounting to said respective cameras respective first and second substantially identical zoom lenses; synchronizing said cameras to zoom to change focus and/or magnification simultaneously and identically; setting said lenses of each of said cameras to a predetermined distance and aligning the vergence of said respective lenses to coincide on an object in said scene at the desired distance; moving the field of view of at least one camera relative to the field of view of the other camera in a predetermined manner upon change of zoom in focus and/or magnification to maintain centration between said cameras in order to prevent spurious parallax between said respective fields of view.

4,418,994

FILM MAGAZINE FOR MOTION PICTURE CAMERA

Robert E. Gottschalk, Los Angeles, and Carl F. Fazekas, Tarzana, both of Calif., assignors to Panavision, Incorporated, Tarzana, Calif.

Filed Oct. 19, 1981, Ser. No. 312,379
Int. Cl.³ G03B *23/02*
U.S. Cl. 352—78 R **6 Claims**

1. A film magazine for a motion picture camera comprising:

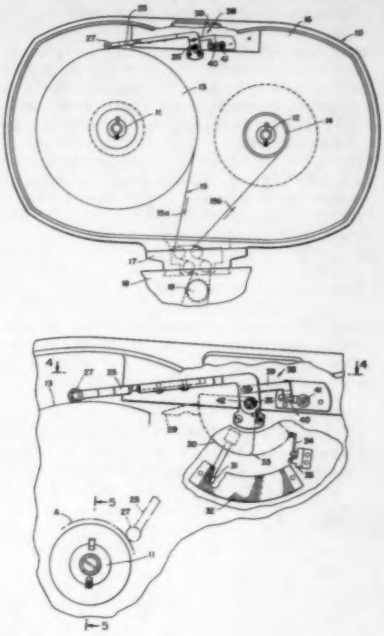
a casing;

a supply hub rotatably mounted within said casing, the supply hub adapted to carry a supply reel;

a motor-driven take-up hub adapted to carry a take-up reel, so that a film strip may pass from the supply reel, out of the magazine and into a camera, and out of the camera and onto the take-up reel;

sensing means for generating a signal indicative of the quantity of film on the supply reel; and

braking means coupled to the sensing means for applying a braking torque to the supply reel, the braking torque being greatest when the sensing means generates a signal indicative of a full supply reel, and gradually decreasing as the amount of film on the supply reel decreases, and then



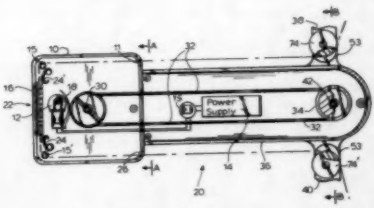
increasing again after the amount of film on the supply reel film reaches a predetermined amount.

4,418,995

MODULE FOR PROJECTING MOTION PICTURES THROUGH A CAMERA

Stanley Mulfeld, 240 E. 76th St., New York, N.Y. 10021

Filed Aug. 24, 1981, Ser. No. 295,718
Int. Cl.³ G03B *21/00*
U.S. Cl. 352—129 **5 Claims**



1. An apparatus for projecting motion pictures with a standard motion picture camera, which comprises;

a lamp housing which fits within a standard motion picture camera film recess having a light transmissive portion that aligns with the camera optical system when the lamp housing is inserted into the camera;

an illumination means, disposed within the lamp housing so that light emitted therefrom passes through the light trans-

missive portion of the lamp housing into the camera optical system; and

a film transport means comprising

a camera drive engagement whereby the camera's film drive is connected to a main drive pulley within the lamp housing;

a drive housing extending from the lamp housing having an auxiliary drive pulley mounted on a rotatable spindle within the drive housing, the rotatable spindle having an end portion extending to the drive housing exterior and a reel drive pulley mounted on the exterior portion of the rotatable spindle;

a main drive belt within the drive housing connecting the main drive pulley and the auxiliary reel drive pulley;

a supply reel arm extending from the drive housing having a supply reel pulley mounted on a rotatable spindle for receiving a film supply reel;

a take-up reel arm extending from the drive housing having a take-up reel pulley mounted on a rotatable spindle for receiving a take-up reel; and

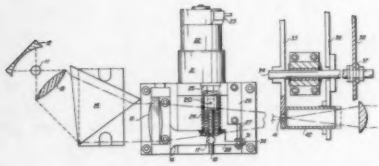
an auxiliary drive belt that may be manually attached between the reel drive pulley and either the take-up reel pulley or supply reel pulley depending on the desired mode of operation.

4,418,996

COLOR BEAM PROJECTOR APPARATUS

Dennis Bellar, and Thurman Sasser, both of Orlando, Fla., assignors to Laser Photonics, Inc., Orlando, Fla.

Filed Sep. 29, 1982, Ser. No. 426,722
Int. Cl.³ G03B *21/28*
U.S. Cl. 353—33 **14 Claims**



1. A color beam projector apparatus comprising in combination:

a light source for producing a beam of light;

a collimating lens for collimating light from said light source;

means for receiving light from said light source and dispersing the light into a plurality of spectral color components;

a movable frame supporting a focusing lens for moving said dispersed, focused light into a plurality of positions; and

a movable surface having a plurality of apertures therethrough and positioned to allow the position of any one of said apertures adjacent a focal point of the movable frame member focusing lens, thereby selecting color components of light through said aperture responsive to the position of the focusing lens and movable surface.

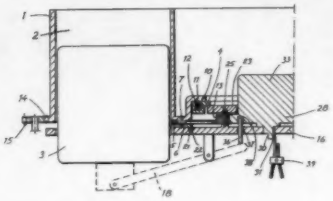
4,418,997

SLIDE PROJECTOR WITH CIRCULAR SLIDES MAGAZINE

Lennart R. Johansson, Landvetter, and Ernst G. K. Hillström, Mölnlycke, both of Sweden, assignors to Victor Hasselblad Aktiebolag, Gothenburg, Sweden

Filed May 6, 1981, Ser. No. 260,886
Claims priority, application Sweden, Jun. 6, 1980, 8004260
Int. Cl.³ G03B *23/06*
U.S. Cl. 353—111 **3 Claims**

1. A slides magazine for use with a slide projector having a plurality of downwardly open compartments for the slides and means for coupling the slide magazine to the projector, the slide magazine comprising a circular frame having a centrally disposed opening to form an inner edge, a geared ring being provided in the outer periphery of the frame to engage a pinion for rotating the magazine, the inner edge being formed into a supporting flange, the frame having mounted thereto, in sequence: an axially movable center ring which is urged away from the circular frame by springs; a radially movable locking ring comprising an upwardly projecting flange along the inner periphery thereof for alignment with the center ring; a centering ring having a downwardly projecting guide edge along the inner periphery thereof; the slide projector having a top surface being provided with a slide aperture and a circular groove for engaging the guide edge in the centering ring in the slide magazine; a center disc having an eccentric guide hole being mounted on the top surface; an eccentric plate being disposed between the center disc and the top surface, the eccentric plate being rotatable between open and closed positions whereby in the closed position the eccentric ring moves radially the locking ring in the slide magazine to release the slide stored in the compartment above the slide aperture, the slide being held within the compartment by the outer edge of the locking ring when the eccentric ring is in an open position, the eccentric plate having a handle portion projecting through the eccentric guide hole in the center disc.

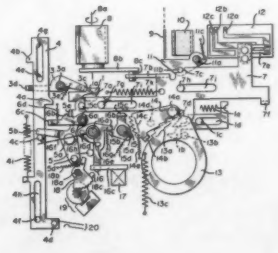


4,418,998

AUTOMATIC FOCUSING DEVICE FOR THE CAMERA

Hiroaki Ishida, Chiba, Japan, assignor to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 143,913, Apr. 25, 1980, abandoned.
This application May 17, 1982, Ser. No. 379,152
Claims priority, application Japan, Apr. 28, 1979, 54-52861
Int. Cl.³ G03B *3/00, 17/38*
U.S. Cl. 354—405 **4 Claims**



1. In an automatic focusing camera of the type which automatically regulates the position of a photographing lens to bring the lens into focus with respect to an object field to be photographed by detecting a distance between the object field and the camera: a movable shutter releasing member movable in first and second stages from a rest position, which corresponds to the beginning of the first stage, to a shutter-operating

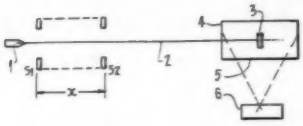
position for initiating operation of a shutter, which corresponds to the ending of the second stage; detecting means operable when actuated for detecting the distance between an object field to be photographed and the camera; a movable actuating member having a charged position and operable when released from the charged position to undergo movement in one direction to actuate the detecting means; means including a movable stopper operable in response to the movement of the shutter releasing member during the first stage of forward movement thereof and before reaching the second stage of forward movement thereof for permitting the actuating member to move in one direction to thereby enable the actuating member to actuate the detecting means; and means coacting with the shutter releasing member for releasably interlocking the actuating member with the shutter releasing member during the course of return movement of the shutter releasing member to its rest position after the actuation of the detecting means to thereby enable the actuating member to be returned to its charged position in interlocked relationship with the return motion of the shutter releasing member in the event the shutter releasing member is returned to its rest position without having reached its shutter-operating position whereby the camera operator can confirm the focusing range prior to shutter operation.

4,418,999

SYNCHRONIZING CIRCUIT

Barry J. Baxter, Werribee, Australia, assignor to Commonwealth of Australia, Canberra, Australia

Filed Apr. 1, 1982, Ser. No. 353,170
Claims priority, application Australia, Mar. 26, 1981, PE8168
Int. Cl.³ G01P *3/66*; G03B *15/16*
U.S. Cl. 354—132 **8 Claims**



1. A synchronising circuit for causing a phenomena to occur at a precise point in the path of travel of an article regardless of the speed of movement of the article in that path, comprising first and second spaced sensors upstream of said precise point and each operable to detect the passage of an article therepast and to provide output signals consequent thereon, a counting circuit which provides a count in one direction when the first sensor provides an output signal, and which counts in the opposite direction from the value of the count first counted, when the second sensor provides an output signal and circuit means responsive to the counting circuit returning to a predetermined count value to initiate the occurrence of said phenomena.

4,419,000

CAMERA CAPABLE OF AUTOMATIC FILM ADVANCING AND REWINDING

Fumio Yoshida, Osaka; Yukio Miki, Sakai, and Takeshi Egawa, Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

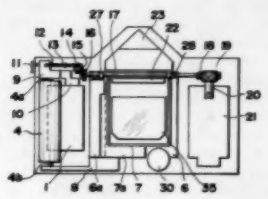
Filed Oct. 19, 1981, Ser. No. 312,569
Claims priority, application Japan, Oct. 27, 1980, 55-149442
Int. Cl.³ G03B *1//12*
U.S. Cl. 354—173.1 **12 Claims**

1. A camera having a first box and second and third boxes located at opposite sides of and adjacent to said first box, said first box including a camera obscura and view finder optical elements including a focusing screen, one of said second and third boxes having a film supply chamber for housing therein an un-exposed film and the other of said second and third boxes having a film takeup chamber for storing therein an exposed film, said camera comprising:

a film advance mechanism for winding the film, said film advance mechanism being provided in the box wherein said film takeup chamber is housed;

a film rewind mechanism for rewinding the film stored in said film takeup chamber, said film rewind mechanism being provided in the box wherein said film supply chamber is housed;

an electric motor provided in said second box;



a rotatable drive shaft connected to one of said advance and rewind mechanisms which is housed in said third box, said rotatable drive shaft traversing an area adjacent to said focusing screen in said first box and out of a finder optical path; and

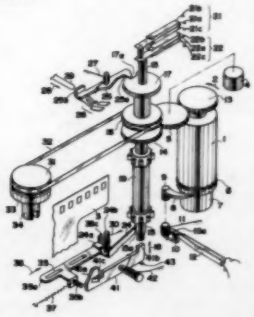
means for alternatively transmitting the rotation of said electric motor to said drive shaft and said one of said advance mechanism and rewind mechanism which is housed in said second box.

4,419,001

MOTOR DRIVEN FILM WIND-UP AND REWIND DEVICE FOR CAMERAS

Shinji Tominaga; Toshinori Imura, and Ikushi Nakamura, all of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed May 24, 1982, Ser. No. 381,717
Claims priority, application Japan, May 29, 1981, 56-83382; Jun. 1, 1981, 56-84737
Int. Cl.³ G03B *1//18*
U.S. Cl. 354—173.1 **6 Claims**



1. In a camera which is adapted to effect a shutter cocking operation with a film rewind by the length of one frame and which includes a film rewinding sprocket, a film take-up spool and a cartridge chamber for receiving a film cartridge, a film wind-up and rewind device comprising:

a film drive mechanism including an electric motor rotatable in both normal and reverse directions and rotating said spool in response to the rotation of said motor in the normal direction for wind-up of the entire length of a film on said spool out of said film cartridge while rotating said

sprocket in response to the rotation of said motor in the reverse direction for rewind of the film back into said cartridge;

means urged from a first position for disconnecting said sprocket from said drive mechanism to a second position for connecting said sprocket with said drive mechanism and movable from the first position to the second position immediately after the initiation of the rotation of said motor in the reverse direction;

a motor drive circuit for supplying said motor with first and second currents which serve to rotate said motor in the normal and reverse directions respectively, said motor drive circuit including first switch means which is switched from a first state to a second state in response to the movement of said movable means from the first position to the second position and which remains in the second position with said movable means being in the second position and being adapted to supply said motor with said first current with said first switch means being in the first state and with a camera rear cover closed and to supply said motor with said second current with said first switch means being at the second state; and

means for detecting increase in the first current which occurs with said motor forced to stop due to completion of the wind-up of the entire length of the film, to generate an output which causes said motor drive circuit to supply said motor with said second current even with said first switch means being in the first state.

4,419,002

LENS EXTENSION AND RETRACTING MECHANISM FOR USE IN A PHOTOGRAPHIC CAMERA OF FOLDING TYPE

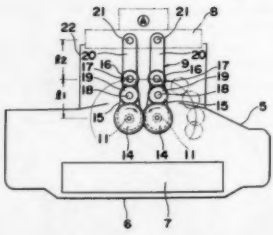
Susumu Fujita, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1982, Ser. No. 388,303

Claims priority, application Japan, Jun. 16, 1981, 56/93284

Int. Cl.³ G03B *17/04*

U.S. Cl. 354—187 **2 Claims**



1. A lens extension and retracting mechanism for use in a photographic camera of folding type, which mechanism comprises a lens board member having mounted thereon a photographic lens means for the photographic camera and arranged to be guided between an extended photographing position at a forward portion of a camera body and a retracted accommodating position within the camera body, sun gear means provided on said camera body, planetary arm means coaxially rotating with respect to said sun gear means, planetary gear means rotatably provided on said planetary arm means and engaged with said sun gear means, extension and retracting arm means arranged to rotate simultaneously with said planetary gear means and being pivotally connected to said lens board member, and an operating means for operating said lens extension and retracting arrangement, said lens board member being arranged to be selectively extended into said photographing position or retracted into said accommodating position through said extension and retracting arm means, with said planetary gear means being subjected to planetary revolution through rotation of said planetary arm means of said sun gear means by the operation of said operating means.

4,419,003

RECORDING SHEET CONVEYING SYSTEM OF PRESSURE FIXING TYPE ELECTROSTATIC PRINTING APPARATUS

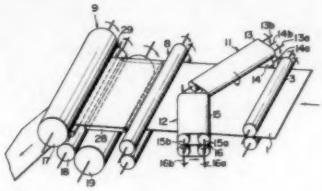
Masakatsu Fujie, Ibaraki; Junichi Matsuno, Toride, and Masao Furuya, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,563

Claims priority, application Japan, Aug. 27, 1980, 55-117111; Sep. 26, 1980, 55-132898; Oct. 31, 1980, 55-152097; Nov. 12, 1980, 55-158294

Int. Cl.³ G03G *15/20*

U.S. Cl. 355—3 FU **17 Claims**



1. A recording sheet conveying system of an electrostatic printing apparatus of the pressure fixing type comprising:

developing means for forming a toner image on a recording sheet;

conveyor means for conveying the recording sheet having the toner image formed thereon;

pressure fixing roller means for fixing by pressure the toner image on the recording sheet;

first tension imparting means located anterior to said developing means for imparting to the recording sheet a tension oriented in a direction perpendicular to the direction of travel of the recording sheet, said first tension imparting means comprising at least one conveyor belt means having a tensioning surface area thereof extending laterally so as to at least substantially span the width of a path traveled by said recording sheet;

second tension imparting means for imparting to the recording sheet a tension oriented in the direction of travel of the recording sheet; and

regulating means located immediately anterior to said pressure fixing roller means for regulating the angle and posture of the leading end of the recording sheet as it is introduced into the pressure fixing roller means.

4,419,004

METHOD AND APPARATUS FOR MAKING TRANSPARENCIES ELECTROSTATICALLY

Manfred R. Kuehnle, New London, N.H., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Nov. 2, 1981, Ser. No. 317,446

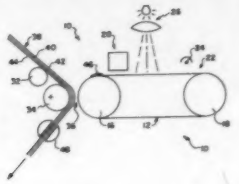
Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 TR **5 Claims**

1. A method of transferring an electrophotographically formed toner image comprising the steps of:

electrophotographically forming an electrostatic toner image on a flexible electrophotographic film member by successively charging the photoconductive surface, exposing the charged surface to actinic radiation through an interposed image pattern, forming a latent electrostatic charge image of said pattern on said photoconductive coating surface and toning the latent electrostatic charge image with liquid toner comprising discrete toner particles suspended in an electrically insulating liquid; provid-

ing a transparent transfer sheet consisting of a substrate having a thin ohmic layer and a thin coating of a resinous composition bonded to said ohmic layer, said resinous coating having a softening range lower than the softening range of the substrate; drying the toner image; locally heating the thin resin coating of the transfer sheet melting same, transporting the dry toner image carrying electrophotographic member and the transfer sheet material simultaneously to and through a precise gap defined therebetween with the melted resin coating facing and in proximity to the toner image carrying photoconductive surface, applying an electrical bias voltage across said gap during passage of said electrophotographic film member and said transfer sheet therethrough whereby electrophoretically to transfer said toner image to said sheet member and into the melted resin, separating said transfer sheet from said electrophotographic film, permitting the resin coating of the transfer sheet to cool with transferred toner image embedded within said resin layer whereby said transfer is effected without loss in resolution or optical density.

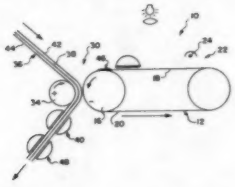


4,419,005

IMAGING METHOD AND APPARATUS

Manfred R. Kuehnle, New London, N.H., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Nov. 2, 1981, Ser. No. 317,448
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 TR **5 Claims**



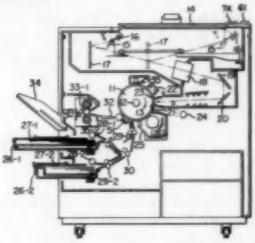
1. A method of transferring an electrophotographically formed toner image comprising the steps of: electrophotographically forming a toner image on the photoconductive coating surface of a flexible electrophotographic film member by successively charging the photoconductive surface, exposing the charged surface to actinic radiation representing an image pattern forming a latent electrostatic charge image of said pattern on said photoconductive coating surface and toning the latent electrostatic charge image with liquid toner comprising discrete toner particles suspended in an electrically insulating liquid, providing a transparent transfer sheet material consisting of a substrate having a thin ohmic layer and a thin coating of a resinuous composition bonded to said ohmic layer, said resinous coating having a softening range lower than the softening range of the substrate, transporting the wet toner image carrying electrophotographic member and the transfer sheet material simultaneously to and through a precise gap defined therebetween with the resin coating facing and in proximity to the toner image carrying photoconductive surface and while the toner image is wet, applying an electrical bias voltage across said gap during passage of said electrophotographic member and said transfer sheet material therethrough electrophoretically to transfer said toner image to the facing surface of said resin coating of the transfer sheet, drying the transferred toner image by removing any residual insulating liquid therefrom, locally heating transfer sheet sufficient to soften the resin coating whereby to embed the discrete toner particles defining the transferred toner image within said coating, the transfer of the toner image being effected without loss in resolution or optical density.

4,419,006

IMAGE PROCESSING APPARATUS UTILIZING DIGITAL DISPLAY MEANS

Nao Nagashima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1981, Ser. No. 309,381
Claims priority, application Japan, Oct. 15, 1980, 55-144803; Oct. 15, 1980, 55-144809; Oct. 15, 1980, 55-144811
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **10 Claims**



1. An image forming apparatus capable of displaying a numerical value comprising:

image forming means for forming images on a recording member, while driving an image forming member;

display means normally utilized for displaying a numerical value related to the number of image formation operations by said image forming means; and

output means for producing a measured value of the state of said image forming member, said display means further capable of displaying said measured value as on alternative to the displaying of said numerical value related to the number of image formation operations.

4,419,007

MULTI-MODE DOCUMENT HANDLING SYSTEM

William Kingsley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 14, 1982, Ser. No. 388,761
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **7 Claims**

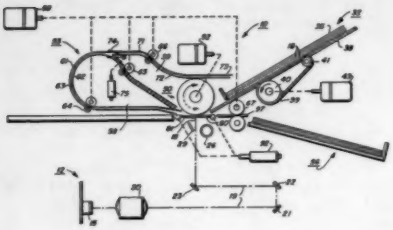
1. A multi-mode document handling system selectively permitting either simplex mode scanning wherein a first side of a document is scanned or duplex mode scanning wherein both first and second sides of the document are scanned, said system including at least one scanning array and a slit-like viewing area through which said document is viewed by said array, the combination comprising:

(a) a document supply tray for supporting one or more documents to be scanned;

(b) document transport means for moving the document to be scanned from said tray and across said viewing area for scanning of said document first side by said array;

(c) mode selection means selectively operable to permit either simplex or duplex scanning of said document, said mode selection means including movable simplex and

duplex pinch elements on each side of said viewing area, each of said pinch elements being adapted when moved to an operative position to cooperate with said document transport means to form a nip permitting said transport means to engage said document and move said document across said viewing area for scanning by said array; and



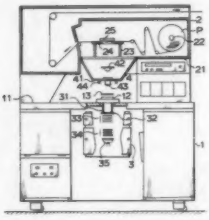
(d) control means for selectively moving one or the other of said simplex and duplex pinch elements to said operative position to provide either simplex or duplex scanning of said document.

4,419,008

PHOTOGRAPHIC COLOR PRINTER

Kanichi Nishimoto, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Jun. 9, 1981, Ser. No. 271,947
Claims priority, application Japan, Jun. 16, 1980, 55-80128
Int. Cl.³ G03B *27/80*
U.S. Cl. 355—38 **6 Claims**



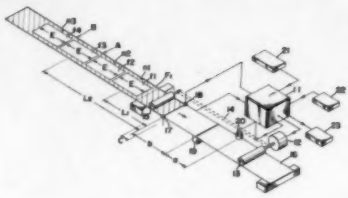
1. A printer for exposing and printing a color printing paper with a certain color balance properly maintained by means of a cut filter assembly comprising three cut filters of a yellow filter, magenta filter and cyan filter each of which is actuated by signals delivered from a plurality of color photo sensors, wherein two light beam flux reducing filters contained in said cut filter assembly are put in use under such an operating condition that the intensity of a light beam coming up from a light source for exposure is previously increased to a predetermined level so as to properly correspond to a negative color film which has an overexposure when a photograph is taken, one of said light beam flux reducing filters being intended for reducing the light beam flux when the negative color film has a normal exposure, while the other one being intended for reducing the light beam flux in cooperation with said first one when the negative color film has an underexposure, said first one being normally inserted into a light beam passage and being adapted to be removed therefrom when printing is performed with a negative color film which has an overexposure, whereby quick printing is ensured with the minimized fluctuation in printing time, maintaining an excellent color balance, irrespective of the fact that the negative color film has either an overexposure or underexposure when the photograph has been taken.

4,419,009

DATA CONVERTING METHOD FOR REORDERED PRINTS

Tadashi Nakamura, Hino, and Haruo Hara, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 6, 1981, Ser. No. 261,251
Claims priority, application Japan, May 20, 1980, 55-66994
Int. Cl.³ G03B *27/10*
U.S. Cl. 355—103 **1 Claim**



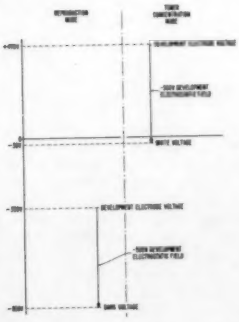
1. A data converting method for reordered prints from a film strip in which print or no print data represented by the distance of a frame from the end of the film strip has been converted into print or no print data determined by a notch on the film strip, which includes the steps of preparing print instructions for reordered prints determined solely by a predetermined distance from the end of the film strip to a desired frame, whereby a notch in the film strip beyond said predetermined distance will result in a no print signal and a notch in the film strip within said predetermined distance will result in a print signal, and forming a notch at an unnotched frame to be printed upon reorder when the desired frame falls within the intended prescribed distance, and using said newly formed notch as a print signal.

4,419,010

METHOD FOR CONTROLLING THE TONER CONCENTRATION IN AN ELECTROSTATIC COPIER

Anthony Grombone, Lafayette, and George W. Van Cleave, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1982, Ser. No. 357,004
Int. Cl.³ G03G *15/06, 21/00*
U.S. Cl. 355—133 **3 Claims**



1. A method for maintaining toner concentration in an electrophotographic reproduction machine which includes photoconductor charging means operable to establish a reproduction photoconductor charge of a first polarity, and developer means including a reproduction development electrode voltage of said first polarity and of a magnitude less than the photoconductor charge, wherein the toning of the photoconductor's latent image results from a development electrostatic field

whose magnitude is the magnitude of the photoconductor's latent image voltage minus the magnitude of said development electrode voltage, comprising the ordered steps of:

(a) reducing said photoconductor charge substantially to zero;

(b) changing the polarity and the magnitude of said development electrode voltage in a manner to establish an electrostatic field substantially identical to said development electrostatic field, but with the resulting toning of said photocondutor being substantially independent of photoconductor charge; and

(c) measuring the optical density resulting from said toning of said photoconductor in step (b), and increasing toner concentration in said developer only if said optical density is too low.

4,419,011
AUTOMATIC RANGE FINDER

Motonobu Matsuda, Kawachinagano, and Yoshihiro Tanaka, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

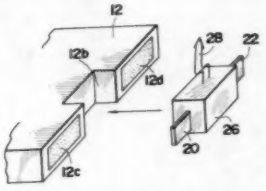
PCT No. PCT/JP80/00285, § 371 Date Jul. 20, 1981, § 102(e) Date Jul. 20, 1981, PCT Pub. No. WO81/01610, PCT Pub. Date Jun. 11, 1981

PCT Filed Nov. 21, 1980, Ser. No. 285,109

Claims priority, application Japan, Nov. 26, 1979, 54-153093

Int. Cl.³ G01C *3/10;* **H01L** *9/00;* **H05B** *33/00;* **G03B** *7/08*

U.S. Cl. 356—1 **18 Claims**



1. A range finder of the type in which light is projected to an object and the reflected light from said object is received by one of a plurality of light receiving elements disposed on a base plate to measure the distance to said object on the principle of triangulation, said range finder comprising a light emitting diode chip composed of two semiconductor layers joined together; first and second electrically conductive frames in planar form are electrically connected respectively to the two semiconductor layers of said chip and extending substantially parallel to the junction surface of said chip, and a package made of a light-transmitting material integrally molding said light emitting diode chip and the electrical connections between said light emitting diode chip and said first and second electrically conductive frames in such a position that the end portions of said electrically conductive frames are exposed; said light emitting diode chip, first second electrically conductive frames and package forming a light source; said light source unit adapted for attachment to said base plate by abutting the projecting portions of said first and second electrically conductive frames extending from said package against the surface of the base plate perpendicular to the base length, said plurality of light receiving elements being fixed and electrically connected to said base plate, whereby the light from the surface extending in a direction substantially perpendicular to the junction surface of said light emitting diode chip is used as the range finding light source.

4,419,012
POSITION MEASURING SYSTEM

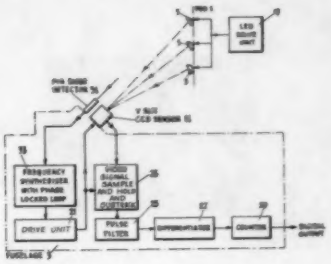
Michael D. Stephenson, Dole, and Winston A. Waller, Whitstable, both of England, assignors to Elliott Brothers (London) Limited, Chelmsford, England

Filed Sep. 3, 1980, Ser. No. 183,805

Claims priority, application United Kingdom, Sep. 11, 1979, 7931493

Int. Cl.³ G01B *11/26;* **H01J** *40/14*

U.S. Cl. 356—141 **5 Claims**



1. A system for measuring the position of one body with respect to another body, said system comprising a transmitter, an area sensor mounted on said one body, means to mount said transmitter on said other body in a position such as to direct a beam of radiation from said transmitter onto said area sensor, said area sensor forming part of a receiver arranged to produce an output indicative of the position of impingement of the beam on the sensor: wherein the transmitter includes means operative independently of the receiver for repeatedly turning the radiation beam on and off and the receiver includes means for subtracting alternate outputs produced by the sensor from immediately preceding previous outputs produced by the sensor, and wherein the receiver includes a second sensor responsive to the radiation beam, and means utilizing the output of the second sensor to control the receiver so that the subtraction is successively performed when the radiation beam is on and when the radiation beam is off, and the output of the subtracting means relates only to radiation in said beam and not to spurious radiation.

4,419,013
PHASE CONTRAST ALIGNMENT SYSTEM FOR A SEMICONDUCTOR MANUFACTURING APPARATUS

Richard J. Heimer, Encino, Calif., assignor to TRE Semiconductor Equipment Corporation, Woodland Hills, Calif.

Continuation-in-part of Ser. No. 248,805, Mar. 30, 1981. This application Jul. 6, 1981, Ser. No. 280,878

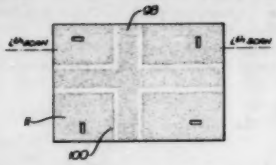
Int. Cl.³ G01B *11/27*

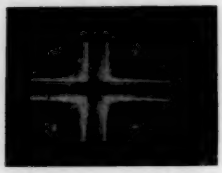
U.S. Cl. 356—400 **8 Claims**

1. In a semiconductor wafer exposure system of the type in which a semiconductor wafer containing an alignment target is moved into alignment with a reticle containing an image to be photoexposed onto said wafer, said reticle containing an alignment window that is transilluminated by light reflected from said wafer in the region of said target, said system comprising:

an incident light phase contrast microscope apparatus arranged for viewing a phase contrast image of the alignment target on said wafer through said reticle alignment window, said phase contrast image being characterized by a bright edge halo surrounding the target, and

video detection apparatus, cooperating with said microscope apparatus, for detecting said image and for producing a signal indicative of the location of said halo with respect to the location of said alignment window.





4,419,014

EXTRUDER MIXER

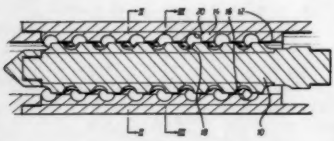
George M. Gale, Shrewsbury, England, assignor to Rubber and Plastics Research Association of Great Britain, Shrewsbury, England

Filed Mar. 31, 1981, Ser. No. 249,303

Claims priority, application United Kingdom, Sep. 23, 1980, 8030586

Int. Cl.³ B29B 1/06

U.S. Cl. 366—99 7 Claims



5. An extruder mixer comprising a hollow cylindrical stator member, a cylindrical rotor member, means journalling the rotor for rotation within the stator, the facing cylindrical surfaces of the rotor and stator carrying respective pluralities of parallel rows of hemispherical cavities, the rows of hemispherical cavities on the rotor and stator being axially offset and the hemispherical cavities in each pair of adjacent rows on both the rotor and stator being circumferentially offset.

4,419,015

AGITATOR HAVING DETACHABLE WEAR SLEEVE

Roy Liddiard, Willowdale, Canada, assignor to General Signal Corporation, Stamford, Conn.

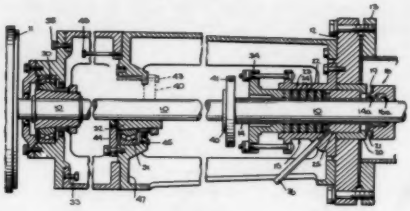
Filed Feb. 19, 1981, Ser. No. 235,823

Int. Cl.³ B01F 15/00

U.S. Cl. 366—349 4 Claims

1. An agitator having a detachable wear sleeve comprising, an agitator drive shaft carrying wear sleeve means secured thereon and extending through an opening in a fixed mounting flange, having detachable stuffing box means secured to one side of the flange opening and axially operable normally open valve means secured to the agitator drive shaft on the other side of the flange opening, having an axially movable element for at times sealing said opening, said element being rotated by the agitator drive shaft, and being operable to a closed position by axial movement of the agitator drive shaft for sealing the opening in the flange when the stuffing box means is detached therefrom, wherein improved replacement means is provided for the wear sleeve means comprising;

(a) the valve means having an axially operable valve element secured on the agitator drive shaft at a point on said other side of the flange and having internal threads to detachably secure one end of the wear sleeve means to the axially operable valve element, whereby the wear sleeve means is rotated with the agitator drive shaft to prevent wear of the agitator drive shaft by the sleeve, and



(b) the wear sleeve means being a single integral longitudinal sleeve on the agitator drive shaft extending through said opening in the flange and through the stuffing box and having external threads at one end thereof for detachably securing the wear sleeve means to the axially operable valve element, whereby the sleeve means can be detached from the agitator drive shaft for replacement solely by operations from said one side of the flange with the valve means closed to prevent flow of fluid from said other side of the flange through the flange opening, without requiring removal of the shaft from the opening in the flange.

4,419,016

DEVICE FOR INDICATING LAST MEDICATION USAGE

Bart J. Zoltan, Old Tappan, N.J., assignor to American Cyanamid Company, Stamford, Conn.

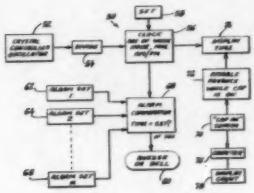
Filed Jul. 2, 1982, Ser. No. 394,579

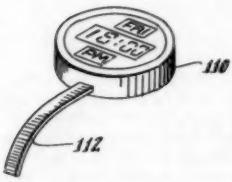
Int. Cl.³ G04B 47/00

U.S. Cl. 368—10 12 Claims

1. A device for providing medication use information to aid in patient compliance with a medication use regimen involving dispensing of medication from a container comprising a time keeping means for keeping the correct time selected from the group consisting of minutes, hour, day, date, week and month, and, combinations thereof, the time keeping means including display means to indicate time, sensor means for sensing when a medication container has been opened or closed to dispense medication, and said signal sensing means providing a signal to the time keeping means in response thereto, and signal processing means within the time keeping means for receiving the signal from the sensor means and activating the display means to indicate the time of the signal, the signal processing means

including means for maintaining such indication of the time of the signal until a further signal from the sensor means is received by which the patient-user is provided with an indication of the last time the container was opened or closed.





4,419,017

ELECTRONIC CLOCK

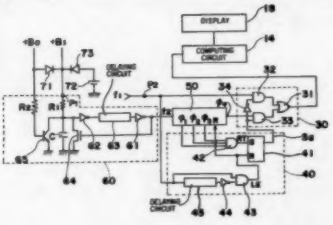
Yasuhiko Okuyama, and Takashi Takezono, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Filed Apr. 14, 1981, Ser. No. 254,072

Claims priority, application Japan, Apr. 24, 1980, 55-54971

Int. Cl.³ G04B *1/00*

U.S. Cl. 368—64 **8 Claims**



6. An electronic clock comprising:

(a) clock means;

(b) an active first standard pulse train means for running said clock means having a first low frequency terminal the output of which is subject to inactivity due to a power failure;

(c) second standard pulse train means having a time constant circuit including a resistor, a capacitor and a second high frequency terminal the output of which charges the capacitor at an oscillation frequency whose time constant is defined by the respective values of the resistor and the capacitor to be higher than the oscillation frequency at the first terminal when the same is active;

(d) an active switching element connected to said second high frequency terminal for stopping the build-up of charge on the capacitor resulting in the stopping of the oscillation thereof when the first low frequency terminal is active;

(e) control means coupled to said first standard pulse train means, and said second standard pulse train means for detecting the inactivity of the first low frequency terminal without using the second standard pulse train; and

(f) change-over means responsive to the detection of the inactivity of the first low frequency terminal by the control means for selectively running said clock means with the second standard pulse train means in case of a power failure that inactivates the first low frequency terminal.

4,419,018

ELECTRONIC WATCH WITH CONTROL MEANS FOR SELECTING AND CORRECTING TIME DATA

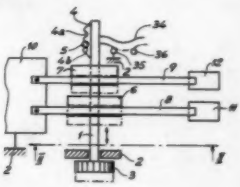
Clement Meyrat, Le Landeron, France, assignor to Ebauches Electroniques, S.A., Switzerland

Filed Jan. 29, 1981, Ser. No. 229,726

Claims priority, application Switzerland, Jan. 31, 1980, 766/80

Int. Cl.³ G04G *5/04*

U.S. Cl. 368—69 **4 Claims**



1. An electronic watch comprising:

a plurality of stores, each containing a particular item of time data and each producing an output signal representing the time date therein;

a digital display device; and

control means comprising a control button displaceable by the user of the watch on the one hand axially between a pushed-in and a pulled-out stable position and on the other hand rotatably, correcting mean responsive to the rotation of the control button while said control button is in said pulled-out position, to provide a correction signal, and selecting means responsive to displacements of said control button from said pushed-in to said pulled-out position to select, from among at least some of said stores, a particular store which is selected as a function of the number of said displacements, to apply the output of the selected store to said display device and to apply said correction signal to said store in order to modify the contents of it.

4,419,019

ANALOG DISPLAY TYPE ELECTRONIC TIMEPIECE

Katsuo Nishimura, and Minoru Watanabe, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,325

Claims priority, application Japan, Apr. 14, 1981, 56-055124

Int. Cl.³ G04B *23/02, 19/04*

U.S. Cl. 368—74 **5 Claims**

1. An analog electronic timepiece provided with an alarm function, comprising:

display means comprising time indicating hands;

an electro-mechanical transducer coupled to said display means for rotating said hands;

transducer drive circuit means for generating drive signals to activate said electro-mechanical transducer to rotate said hands;

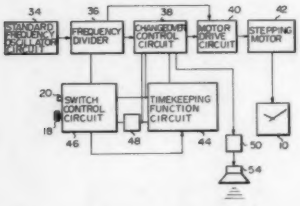
circuit means for generating a unit time signal comprising a pulse train of period 60/n seconds, where n is an integer, and a plurality of timing signal pulse trains of shorter period than said unit time signal;

externally operable switch means, actuatable for generating signals selectively designating operation in a current time display mode in which current time is indicated by said hands, a current time setting mode in which said current time indication can be corrected, an alarm time display mode in which a preset alarm time is indicated by said hands and an alarm time setting mode in which said preset alarm time can be corrected, and further actuatable in said current time setting mode and alarm time setting mode for generating time setting signal pulses;

a timekeeping function circuit for storing data representing the difference between said preset alarm time and the current time, and for producing an alarm coincidence signal when said difference becomes zero as the current time reaches coincidence with said alarm time;

alarm signal generating means for generating an audible alarm signal in response to said alarm coincidence signal;

changeover control circuit means responsive to signals from said externally operable switch means designating changeover from operation in said current time display mode to said alarm time display mode for generating signals which



are applied to said transducer drive circuit means in accordance with said data in said timekeeping function circuit for thereby driving said electro-mechanical transducer to rotate said hands from positions indicating current time into positions indicating said preset alarm time, and for generating signals which act to rotate said hands into positions indicating current time, from said alarm time indicating positions, when signals from said switch means designate changeover from said alarm time to said current time display mode, said changeover control circuit means operating during said current time display mode to transfer said unit time signal pulses to said drive circuit means, which is responsive thereto for driving said electro-mechanical transducer to advance said hands by one step for each of said unit time signal pulses, and further operating during said current time and alarm time display modes for transferring said unit time signal pulses to said timekeeping function circuit means to thereby successively decrement said data representing the difference between said alarm time and current time; and

alarm time setting signal generating circuit means responsive to each pulse of said time setting signal during said alarm time setting mode for generating n alarm time setting pulses, where n is said integer, said alarm time setting pulses being transferred to said transducer drive circuit means for thereby producing drive signals to rotate said hands by n steps and therefore by an amount representing one minute, for each of said time setting signal pulses, said alarm time setting pulses being further transferred to said timekeeping function circuit means for correcting said data held therein representing the difference between the alarm time and current time.

4,419,020

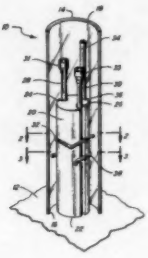
MOUNTING APPARATUS

Harold I. Hill, 222 Spring Hill Rd., and Roger W. Targowski, 216 Alma Dr., both of Fairfield, Conn. 06430

Filed Mar. 31, 1981, Ser. No. 249,531

Int. Cl.³ G01N *25/00*; G01K *17/00*

U.S. Cl. 374—12 **9 Claims**



1. Apparatus for use in a thermal analyzer, said apparatus comprising:

at least two spaced apart columns for supporting sample receiving receptacles extending from a base plate; and

means for maintaining said columns a preselected distance apart and for providing at least two points of rigid contact with each said column, said means including a support member having longitudinal grooves extending thereinto from the periphery thereof; each one of said grooves being adapted to accept one of said columns thereinto and make at least two points of rigid contact therewith.

4,419,021

MULTI-FUNCTIONAL SENSING OR MEASURING SYSTEM

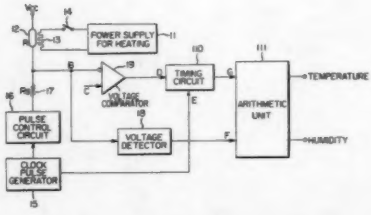
Jiro Terada, and Tsuneharu Nitta, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 28, 1981, Ser. No. 229,185

Claims priority, application Japan, Feb. 4, 1980, 55-12891; May 23, 1980, 55-69392

Int. Cl.³ G01K *7/00*; G01W *27/02*

U.S. Cl. 374—101 **6 Claims**



1. A multi-functional sensing system capable of detecting both the temperature and humidity to which it is subjected, comprising:

(a) a sensing element comprising a porous dielectric metal oxide ceramic plate the dielectric constant of which varies with temperature and the electric resistance of which varies with humidity, the major surfaces of said ceramic plate having a pair of electrodes thereon,

(b) a resistor element connected in series with said sensing element to one of the electrodes of said pair of electrodes on one of the major surfaces,

(c) a rectangular pulse generator means for supplying rectangular pulses across said sensing element and resistor element,

(d) means in an electrical circuit connected to the junction of the sensing element and the resistor element for determining temperature by detecting the time difference between the time at which the pulse signal is applied and the time required for the voltage across one of said elements of said series connected elements to reach a reference voltage level, and

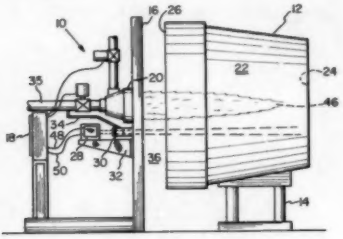
(e) means in the electrical circuit connected to the junction of the sensing element and the resistor element for detecting humidity by determining the amplitude of the steady state voltage across one of said elements of said series connected elements.

4,419,022

NONCONTACT TEMPERATURE SENSING METHOD AND APPARATUS FOR LADLE PREHEATING

Robert T. Ely, Pittsburgh, Pa., assignor to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Apr. 21, 1982, Ser. No. 370,366
Int. Cl.³ G01J *5/08*
U.S. Cl. 374—125 **12 Claims**



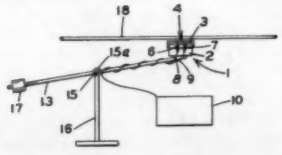
1. In a ladle heating apparatus in which a ladle and a wall are juxtapositioned so that burner means associated with the wall fire through a ladle opening and into an interior thereof for preheating purposes, the improvement comprising a sight tube extending through said wall and a noncontact radiation pyrometer mounted for sighting through said sight tube and measuring the radiation of a ladle interior surface.

4,419,023

FAST-RESPONSE THERMOCOUPLE PROBE

Nathaniel E. Hager, Jr., Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 10, 1981, Ser. No. 291,179
Int. Cl.³ G01K *1/14, 7/04*
U.S. Cl. 374—179 **11 Claims**



1. A passive fast-response insulated-foil thermocouple probe comprising

(a) a mounting block movable with a handle;

(b) a layer of insulating material having a low product of thermal conductivity, density, and specific heat mounted on the upper surface of said mounting block;

(c) a thin-foil ribbon thermocouple comprising two dissimilar metal foils joined in a junction at corresponding ends thereof and positioned on the upper surface of said layer of insulating material;

(d) a low-areal-heat-capacity cover film mounted over the upper surface of the insulating layer and the foil ribbon thermocouple thereon and extending at least partially down at least one of the sidees of the mounting block;

(e) electrical connections on each of said two dissimilar metal foil ribbons of the thermocouple at their extremities adapted to electrically connect in series, said thermocouple, a reference junction, and means for sensing electromotive force developed in a circuit, whereby said sensing means responds to the differential between the electromotive force produced by the foil and reference junctions; and

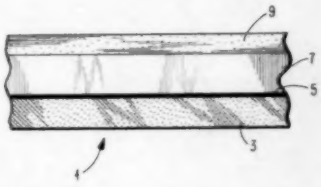
(f) said probe movable against an object with a preselected amount of force for measuring the temperature of an object without modifying its surface temperature.

4,419,024

SILICON DIOXIDE INTERMEDIATE LAYER IN THERMAL TRANSFER MEDIUM

Patsy A. Bowlds, Paris, Ky.; Bruce M. Cassidy, Fairfax, Va.; Arthur E. Graham, Lexington, Ky.; Robert J. Huljak, Lexington, Ky.; Donald W. Stafford, Lexington, Ky., and Deh C. Tao, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1981, Ser. No. 333,349
Int. Cl.³ B41J *31/00*
U.S. Cl. 400—120 **31 Claims**



1. A transfer medium for non-impact thermal transfer printing comprising a thermal transfer layer, a resistive layer, and a layer of silicon dioxide on said resistive layer between said resistive layer and said transfer layer.

4,419,025

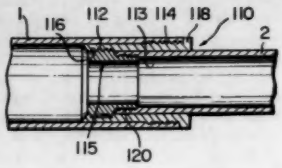
LOCKING DEVICE IN A TELESCOPIC TUBULAR TRIPOD LEG ELEMENT ASSEMBLY

Shoichiro Takahashi, Yokohama, Japan, assignor to Kenlock Corporation, Yokohama, Japan

Filed Feb. 24, 1982, Ser. No. 351,980
Claims priority, application Japan, Mar. 17, 1981, 56-36308[U]
Int. Cl.³ B25G *3/00*
U.S. Cl. 403—14 **8 Claims**

1. A locking device in a telescopic tubular tripod leg element assembly comprising at least inner and outer tubular leg elements of circular cross-section, said locking device comprising a sleeve having at its one end an internal multiple thread and at the other end an inner peripheral face forming a guide face for said inner tubular leg element, said sleeve being fixedly secured to the inner peripheral face of said outer tubular leg element, said inner tubular leg element having an inner end portion with

an enlarged diameter and an external multiple thread provided at the enlarged diameter of the inner end of said inner tubular



leg element and adapted to be engaged by said internal multiple thread of said sleeve.

4,419,026

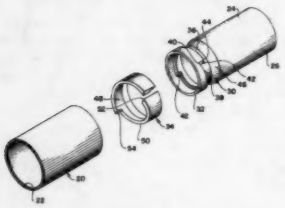
INTERNAL LOCKING DEVICE FOR TELESCOPIC ELEMENTS AND METHOD OF MAKING THE SAME

Alfonso Leto, 12255 Gerald Ave., Granada Hills, Calif. 91344

Filed Aug. 28, 1980, Ser. No. 182,025

Int. Cl.³ F16B *7/10*; F16D *1/12*

U.S. Cl. 403—104 **7 Claims**



1. An improved internal releasable locking device for telescoping tubular members wherein there is an outer telescoping member having an internal annular surface wherein the radii extending annularly therearound is equidistant from the central longitudinal axis of the member, and an arcuate locking cam element having an outer peripery generally complementary with the internal annular surface of the outer telescoping member and adapted to interfit within an inner telescoping member, the improvement comprising:

at least one camming groove formed in and as a part of said inner telescoping member adjacent an end thereof;

said groove having at least one surface spaced annularly inwardly of said outer annular surface that acts as a cam surface to cooperate with and move said arcuate locking cam in a direction radially outwardly from said groove whereby when said outer telescoping member is fitted over said locking cam element and said inner telescoping member, rotation of one of said telescoping members will cammingly urge said locking cam element into tight locking engagement against the internal annular surface of said outer telescoping member.

4,419,027

BELLOWS SEAL FOR BALL AND SOCKET JOINTS

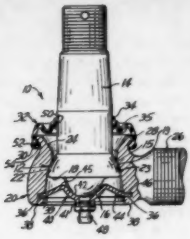
William H. Trudeau, Brighton, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Apr. 6, 1981, Ser. No. 251,253

Int. Cl.³ F16C *11/06*

U.S. Cl. 403—134 **12 Claims**

1. In a ball and socket joint comprising a ball and a socket in mutual swivelling sliding engagement, said ball having a stud integrally formed therewith projecting outwardly through one end of said socket, the improvement comprising said socket having at said one end a substantially frusto-conical flange formed such as to radially diverge as said flange extends in the direction of the stud and a resilient tubular body disposed around said stud, wherein said tubular body has an open end



stretched around said stud and another open end provided with an integral reinforcing bead elastically passed over the largest outside diameter portion of said frusto-conical flange and said flange has an elongated perimeter.

4,419,028

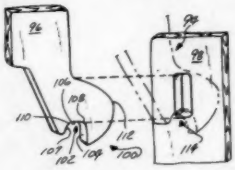
KNOCK DOWN CHAIR

Billy F. Roland, 37805 Maple Hill, Mt. Clemens, Mich. 48043

Division of Ser. No. 125,691, Feb. 29, 1980, Pat. No. 4,348,052. This application Jun. 15, 1981, Ser. No. 273,470

Int. Cl.³ F16B *5/00*

U.S. Cl. 403—353 **2 Claims**



2. A joint for interlocking a pair of intersecting walls comprising:

a first wall and a second wall;

said first wall comprising a hook projection configured to rotate within an aperture to interlock therewith and an axial flange projection extending from a common edge;

said second wall having a first polygonal opening with a height approximately the radius of the outside edge of said hook projection to rotatingly receive said hook projection, and a second polygonal opening spaced from said first opening to slidingly receive said flange projection upon said common edge being engaged with said second wall; and

whereby the pair of walls are interlocked when said hook projection is rotatingly inserted into said first opening and said flange projection is inserted into said second opening and whereby relative rotation of said first and second walls along an axis normal to said second wall is prevented.

4,419,029

THREADED FASTENER

Michael Wenzel, 2251 Clinton Ave., #5, Alameda, Calif. 94501

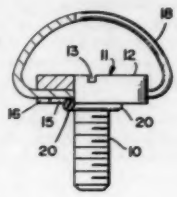
Filed Mar. 22, 1982, Ser. No. 360,803

Int. Cl.³ B25G *3/00*; F16G *11/00*; F16D *1/00*

U.S. Cl. 403—408 **5 Claims**

5. A device comprising two pieces adapted to be held together with a threaded fastener, including a first piece having threaded means to engage the threaded fastener and a second

piece having a hole through which the threaded fastener extends, said device including a threaded fastener comprising a threaded shaft, a laterally expanded head connected to one end of the shaft, said head having a ring-shaped cavity surrounding the threaded shaft and two diametrically opposed openings



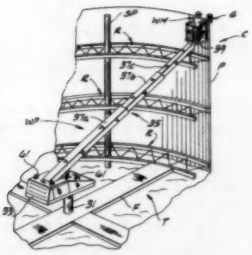
through the side of said head and into said cavity, a D-ring having opposing ends loosely fitted in said opposed openings, an elastomeric ring surrounding the threaded shaft partly within said ring-shaped cavity, a recess in said first piece having a diameter greater than the diameter of said D-ring and deeper than said ring-shaped cavity.

4,419,030

APPARATUS FOR AND METHOD OF CONSTRUCTING A SHEET PILING SHORING STRUCTURE

Werner W. Burkemper, Manchester, Mo., assignor to Burkemper Methods, Inc., St. Louis, Mo.

Filed Sep. 14, 1981, Ser. No. 302,073
Int. Cl.³ E02D *5/02*
U.S. Cl. 405—278 **14 Claims**



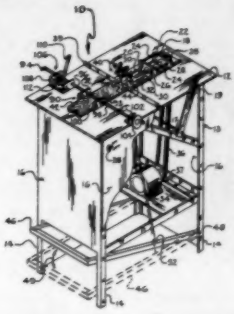
1. A system for the construction of a shoring structure having a substantially vertical wall formed of a plurality of interlocked, elongate piling members driven into the ground, each of said piling members having means along its sides for interconnection with adjacent piling members, said shoring structure being constructed by positioning at least one of said piling members generally vertically and by at least partially imbedding this one piling member into the ground, the next piling member is then hoisted above the upper end of said one vertical piling member and the interconnection means of the one piling member and the hoisted piling member are engaged and the hoisted piling member is lowered relative to said one piling member, said system comprising apparatus for supporting a workman at a desired position adjacent the upper end of said one piling member so as to enable him to guide said hoisted piling member into endwise interlocking relation with said one piling member, said workman support including a base, a spud pile adapted to be imbedded in the earth, said base being removably securable to said spud pile whereby said workman support may be readily attached to and readily removed from said spud pile, a boom coupled to the base and extending upwardly therefrom, a workman support platform carried by the outer end of said boom, said boom including means for selectively positioning said workman support platform at substantially any desired position along said partially imbedded piling members thereby to enable said workman to aid in the interconnection of said piling members.

4,419,031

APPARATUS AND METHOD FOR DRILLING DOWEL HOLES

James F. Palma, Rte. 2, Box 116A, Lonsdale, Minn. 55046

Filed Oct. 29, 1981, Ser. No. 316,410
Int. Cl.³ B23Q *5/22*; B23B *49/00*
U.S. Cl. 408—1 R **12 Claims**



1. An apparatus for drilling matching dowel holes in a workpiece, the apparatus comprising:

a frame having a top with an upper surface;

a workpiece positioning bar extending upwardly from said frame top surface;

drilling means for drilling dowel holes, said drilling means being slidably attached to the upper frame top surface and movable along a drilling axis at right angles to said first positioning bar;

centering means for centering a workpiece with respect to the drilling axis, said centering means being movable along a positioning axis;

positioning means for positioning the workpiece through positioning the centering means in at least two dowel hole drilling positions, the positioning means including first and second stop members defining first and second dowel hole drilling positions and a stop engaging member positionable alternatively to engage the first and second stop members and movable therebetween in a direction parallel to the positioning axis; and

a connecting member having opposite ends being connected at one end to the centering means and connected at the other end to the stop engaging member of the positioning means such that when the stop engaging member is moved to engage the first stop member, the centering means is moved to the first dowel hole position and when the stop engaging member is moved to engage the second stop member, the centering means is moved to the second dowel hole position thereby selectively positioning the workpiece, when in contact with said first positioning bar, in the first and second dowel hole drilling positions.

4,419,032

BORING TOOL

Thomas Flowers, 1069 E. York, Flint, Mich. 48505

Filed Feb. 4, 1981, Ser. No. 231,469
Int. Cl.³ B23B *45/14*
U.S. Cl. 408—112 **4 Claims**

1. A boring tool adapted for operation in a limited workspace for boring holes through a workpiece against which the tool is placed, said boring tool comprising:

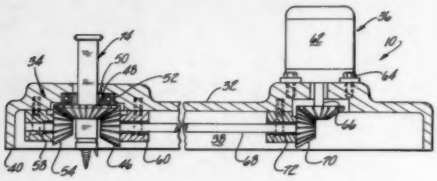
a elongated rigid housing,

angle drive means mounted adjacent a first end of said housing to deliver rotation about an axis transverse to the length of said housing,

a boring bit slidably and drivably mounted on said angle drive means so as to permit axial movement of said boring bit while being rotated about said transverse axis, and

transmission means mounted on said housing for transmitting rotation from a power source adjacent the second end of said housing to said angle drive means,

said boring bit comprising a shaft via which the boring bit is coupled with said angle drive means, a second shaft telescopically engaged and keyed with said first shaft so as to be axially shiftable relative to the first shaft while being rotatably coupled with the first shaft, a cutting head mounted on the second shaft at the axial end thereof



nearer the workpiece, resiliently yieldable means operatively disposed between the two shafts for biasing the second shaft axially relative to the first shaft away from the workpiece but resiliently yielding during certain boring operations so as to allow the second shaft to advance axially toward the workpiece relative to the first shaft, said first shaft having an axial lost motion connection with said angle drive means limited by stops, said cutting head comprising a screw thread for engaging the workpiece to advance the cutting head into the workpiece upon rotation of said boring bit by said angle drive means so as to bore a hole into the workpiece, said axial lost motion connection providing axial advancement of said first and second shafts in unison during boring operations until said resiliently yieldable means begins to yield.

4,419,033

SYSTEM FOR RELEASABLY SECURING MOVABLE SUPPORT ELEMENTS ON SPACE VEHICLES

Martin Roth, Taufkirchen, and Helmut Kiendl, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Filed May 8, 1981, Ser. No. 261,755

Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018245

Int. Cl.[3] **B60P** *1/64, 7/06;* **B63B** *25/00*

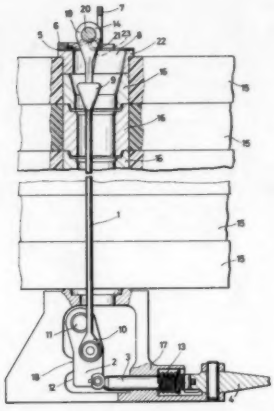
U.S. Cl. 410—32 **8 Claims**

1. A system for releasably securing in place support elements of a space vehicle which are movable when released out of said secured position comprising: a holding element extending through said support elements having an inner end and an outer end; a lever means pivotally mounted about an axis and having said inner end of said holding element pivotally mounted thereto eccentrically relative to said axis; stop means limiting movement of said lever means in one direction; spring loaded piston means adapted to engage with said lever means; a blocking element engaging said spring loaded piston means and blocking movement thereof to hold said means against said stop means, said spring loaded piston means operating to release said lever means to enable pivotal movement of said lever means about said axis away from said stop means when released by said blocking element; a spring loaded release lever engaged by said outer end of said holding element and retained by said holding element in a position releasably securing said support elements; a support bushing having said release lever rotatably mounted thereto; and limitation means limiting to 90° the movement of said release lever from a position engaging said outer end of said holding element to a position releasing said outer end; said holding element being adapted to slide through an opening in said support bushing to release said support elements when said release lever moves to release said outer end thereof.

5. A system for releasably securing in place support elements, particularly for use in space vehicles, comprising:

a longitudinal holding element adapted to extend through openings in said support elements from one side thereof to another, said holding element having an inner end and an outer end;

a holding lever pivotally mounted about a lever axis and having said inner end of said holding element pivotably connected thereto about a pivot axis located eccentrically relative to said lever axis;



release lever means interposed between said support elements and said outer end of said holding element to apply against said support elements a holding force exerted against said release lever means by said holding element when said holding lever is in a pivotal holding position to press said outer end against said release lever;

spring means applying to said release lever a biasing spring force against the holding force of said holding element; and

releasable blocking means operating to apply against said holding lever a blocking force tending to prevent said holding lever from moving away from said pivotal holding position and also operating to release said blocking force to enable said support elements to be released from said holding force applied thereto by said holding lever.

4,419,034

TELESCOPABLE RETRACTABLE STACKER KEY LOCKING DEVICE

John M. DiMartino, Sayville, N.Y., assignor to Line Fast Corporation, Holbrook, N.Y.

Filed Jan. 12, 1981, Ser. No. 224,320

Int. Cl.[3] **B60P** *7/08, 7/13;* **B61P** *49/00*

U.S. Cl. 410—83 **6 Claims**

1. A heavy duty retractable selectively operable stacker key locking device adapted to secure a corner fitting of a shipping container to a flat base member wherein the device can be retracted and vertically partially telescoped beneath the base member, the corner fitting having an elongated orifice in the underside thereof for engagement with the locking device comprising:

(a) a tubular housing having a bottom wall and side walls, depending from the base member forming a vertical pas-

sageway having an upper orifice communicating with the area above the base member;

(b) a keyway orifice formed in the bottom wall of the housing;

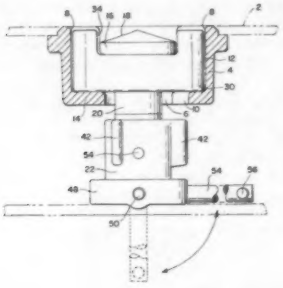
(c) a shaft member vertically and rotatably mounted in the tubular housing and extending through the keyway orifice;

(d) a crosshead member fixidly mounted on the upper end of the shaft member;

(e) retainer means mounted on the lower end of the shaft member to prevent the shaft member from being drawn upwardly through the keyway orifice of the tubular housing;

(f) a neck member mounted within the tubular housing and capable of having a portion of said neck member being extended through the upper orifice thereof and of vertical reciptocation with respect to the tubular housing, the crosshead member and the neck member having a lateral cross sectional area similar in size and shape to the elongated orifice of a corner fitting;

(g) a shaftway extending through the center of the neck of a size sufficient to entrain a portion of the shaft member and to permit the shaft member to move vertically and rotatably with respect to the neck member when entrained therein;



(h) groove means traversing across the shorter axis of the upper surface of the neck member capable of entraining the crosshead member therein when the elongated axis of the crosshead member is biased across the shorter axis of the neck member when the crosshead member and neck member are fully retracted within the tubular housing;

(i) key means fixidly mounted on the shaft member shaped and dimensioned to pass vertically through the keyway orifice, the key means being positioned on the shaft member a sufficient distance apart from the crosshead member to allow the key means to be positioned beneath the tubular housing when the device is in a retracted position, the key means having an upper surface area which prevents it from being drawn through the passageway of the neck opening, and a vertical dimension which causes it to raise the neck member partially above the upper orifice of the tubular housing while simultaneously raising the crosshead member to a position such that the underside of the crosshead member is completely above the neck member with the lower side of the key means being above the inner bottom wall of the tubular housing while simultaneously having a rotatable portion of the shaft member entrained within the keyway orifice and having the upper surface of the retainer means abutting against the outerside of the bottom wall of the tubular housing;

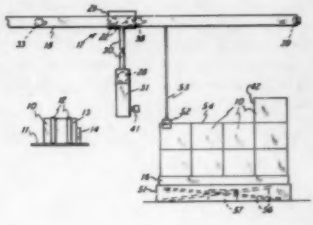
(j) lever means fixidly attached to the retainer means to facilitate rotation of the shaft member.

4,419,035

METHOD AND APPARATUS FOR MOVING BUNDLES OF SHEETS

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Apr. 21, 1982, Ser. No. 370,372
Int. Cl.³ B65G 57/24
U.S. Cl. 414—71 **10 Claims**



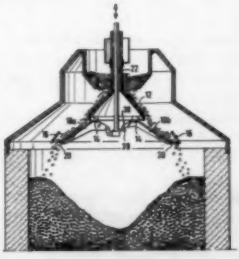
6. Apparatus for picking up bundles of sheets at a pickup station and stacking the bundles of sheets onto a pallet and with each of the bundles of sheets being bound in an elongated shape and having opposite ends and having open opposite sides in respective vertical planes, comprising a pallet at a pallet location, an electrically operated overhead crane, an electrically operated powered clamp suspended from said overhead crane, electrically powered means connected with said clamp for lowering and raising said clamp relative to said crane and for moving said clamp, said powered clamp including oppositely facing abutments for abutting the opposite ends of the bundle of sheets, a photo-electric sensor operatively connected with said powered means for energizing the latter to move said clamp and a first of the bundles between said pickup station and said pallet, said sensor being mounted on said clamp in a position to sense one of said opposite sides of said first of the bundle of sheets on said pallet and thereby energize said powered means to position a second of the bundle of sheets with its one of said opposite sides thereon in contact with said one side of the first of the bundle of sheets and in side-by-side relation on said pallet.

4,419,036

APPARATUS FOR CHARGING A SHAFT FURNACE

Ulrich Beckenbach, Fontanestr. 13, and Helmuth Beckenbach, An den Linden 47, both of D-4005 Meerbusch 1, Fed. Rep. of Germany

Filed Dec. 24, 1981, Ser. No. 334,430
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125410
Int. Cl.³ C21B 7/20
U.S. Cl. 414—160 **4 Claims**



1. In an apparatus for charging a shaft furnace for burning and sintering material in a lump form, which material is se-

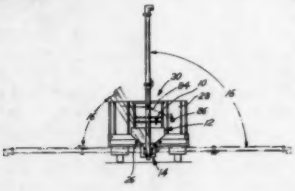
lected from a group consisting of limestone, dolomite, magnesite, cement and the like, said apparatus including a distribution cone, a plurality of distribution flaps pivotally mounted adjacent a lower edge of the cone, said flaps having impact surfaces forming a truncated cone which is coaxial to the distribution cone and means for pivoting the flaps between various positions to make it possible to vary the diameter of the base of the truncated cone, said means including a linkage passing axially through the distribution cone, the improvements comprising each of the flaps adjacent an outer end having a deflection plate arranged in spaced relation thereto to form a space therebetween, each of said deflection plates having impact surfaces extending substantially parallel to the impact surfaces of the distribution flap.

4,419,037

TRUCK AUGER-HOPPER CONSTRUCTION

Donald W. Niewold, 149 N. Market St., Paxton, Ill. 60957

Filed Dec. 30, 1980, Ser. No. 221,293
Int. Cl.³ B60P *1/04, 1/40*
U.S. Cl. 414—489 **20 Claims**



1. An auger-hopper construction for mounting to an inclinable body of a truck to receive material from the truck comprising:

first hopper means, said first hopper means having an opening adjacent the bottom thereof,

first hopper mounting means for mounting said first hopper means to the truck body to incline with the truck body when the body is inclined and in a position to receive the material from the truck body in various positions of inclination of the body,

second hopper means having an opening therein,

pivotal mounting means for pivotally mounting said second hopper means to said first hopper means to receive material from said opening in said first hopper means, said pivotal mounting means permitting said second hopper means to pivot about an axis between upper and lower pivot limits, and wherein the lowest portion of said second hopper means does not project substantially beneath said first hopper means when said second hopper means is pivoted about said axis to extend horizontally,

auger tube means,

swivel mounting means mounting one end of said auger tube means to said second hopper means and overlying the opening therein to receive material from said latter opening,

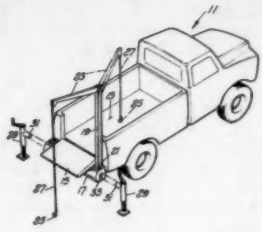
said pivotal mounting means and swivel mounting means cooperating to simultaneously permit inclination of said auger tube means in a plane substantially perpendicular to the axis of the pivotal movement and also in a plane substantially parallel to the axis of the pivotal movement and at substantially all angles of inclination of the truck body when said first hopper means is mounted to the truck body.

4,419,038

BUMPER MOUNTED FOLDABLE CRANE HOIST

Billy D. Pendergraft, 22321 Vanowen Ave., Canoga Park, Calif. 91303

Continuation of Ser. No. 15,559, Feb. 26, 1979, abandoned. This application Jul. 2, 1981, Ser. No. 279,919
Int. Cl.³ B60P *1/00, 1/04;* **B66C** *23/26, 23/64*
U.S. Cl. 414—543 **9 Claims**



1. A bumper mounted foldable crane hoist for vehicles having a chassis and a load bed with a tail gate forming an access opening to said load bed comprising:

an elongated horizontal housing structure having a bottom and spaced apart end and side walls, means affixed to one of said side wall for mounting said housing to the vehicle chassis below the level of the load bed along the edge of the access opening, said housing forming a bumper for the vehicle;

an elongated support column with a base section attached to one end thereof, shaft means pivotally mounting: said base section on a horizontal axis between said side walls at one end of said housing structure to facilitate the movement of said support column in a vertical plane relative to said housing structure from a stored horizontal position with said support column lying within and extending along the length of said housing structure to a fixed upright operating position with said support column disposed perpendicular to said housing structure; means on said base section for maintaining said support column in said fixed upright operating position;

an elongated boom pivotally mounted on the other end of said support column opposite said base section to move from a stored position alongside said support column to an operating position extending outwardly from the axis of said support column;

a hoist line mounted on said boom for handling a load, means on said housing for applying a hoisting force to said hoist line, means mounted on said base section which are selectively and operatively connectable with said hoist line to pivot said support column to said upright operating position;

anti-friction bearing means mounted within said support column and base section for supporting said boom for rotation about the central axis of said support column relative to said base section to shift loads suspended by said hoist line over and away from said load bed.

4,419,039

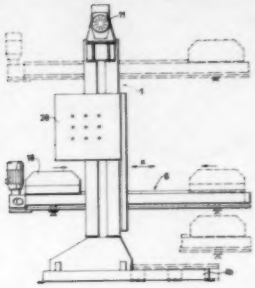
APPARATUS FOR LOADING OBJECTS

Bengt A. Bengtsson, 2 Silurvagen, 595 00 Mjolby, Sweden

Filed Mar. 4, 1981, Ser. No. 240,296
Int. Cl.³ B66F *9/00*
U.S. Cl. 414—590 **5 Claims**

1. Apparatus for loading objects, comprising in combination a first horizontal frame structure which is movable vertically relative to an upright support structure, said frame structure supporting a second horizontal frame which is movable horizontally relative to the first frame structure in one direction, said second frame supporting a carriage which is movable in a

direction perpendicular to the movement of said second frame and is provided with a catching mechanism such that said catching mechanism by the displacement of the second frame in one horizontal direction and the displacement of the carriage in a horizontal direction perpendicular thereto may be located over an object at a loading area and moved to a desired



position over an unloading area, wherein the first frame structure is rectangular with one side open, two opposite sides thereof being intermediate the ends thereof slidably guided in two spaced apart uprights which latter are mutually connected by means of an upper cross bar, said uprights being each secured to a bottom rail extending perpendicular to said cross bars.

4,419,040

BACKHOE SWING MECHANISM

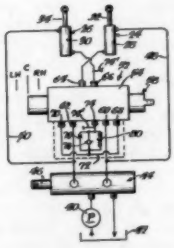
Carl O. Pedersen, and Herman J. Maurer, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Dec. 10, 1981, Ser. No. 329,349

The portion of the term of this patent subsequent to Jun. 21, 2000, has been disclaimed.

Int. Cl.³ E02F *3/72*

U.S. Cl. 414—687 **19 Claims**



1. In an implement having a frame attached to a tractor having a hydraulic system, and a swing tower pivotally connected to said frame about a vertical pivot axis and supporting a boom, an arrangement for pivoting said swing tower and said boom through an arc about said vertical axis through an arc of travel, comprising:

(a) two hydraulic motors pivotally interconnected between the frame and the swing tower, each of said motors having a cylinder end and a piston rod end, the extension and contraction of said motors pivoting said swing tower about said vertical pivot axis on the frame, each of said motors being fully extended when its respective centerline intersects said vertical axis;

(b) a hydraulic circuit connected to each motor by conduit means leading from the tractor hydraulic system;

(c) directional flow control means operatively connected to said conduit means for selectively directing fluid under pressure from said hydraulic system to said two hydraulic motors;

(d) restricting means in said hydraulic circuit for restricting fluid flow from both of said motors during movement of said swing tower and said boom through end portions of their arc of travel prior to reaching the ends of the arc of travel; and

(e) said hydraulic circuit including sequencing valve means hydraulically joined to said motors, said flow control means, and said restricting means,

whereby when said flow control means direct fluid to pressurize the piston rod end of one of said motors in pivoting said swing tower through said arc, said sequencing valve means sequentially provides fluid communication between:

said one piston rod end and both the cylinder ends across said restricting means;

said one piston rod end and the cylinder end of the other motor, and between the cylinder end of the one motor and the piston rod end of the other motor; and

both the cylinder ends and the piston rod end of the other motor across said restricting means.

4,419,041

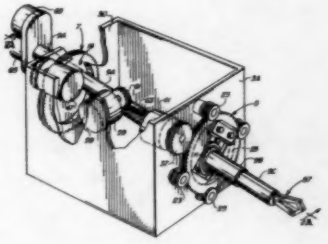
SPACIAL MECHANISM AND METHOD

Stanley E. Rose, 3216 E. Sweetwater, Phoenix, Ariz. 85032

Filed Jun. 26, 1981, Ser. No. 277,988

Int. Cl.³ B66C *1/00*

U.S. Cl. 414—739 **25 Claims**



25. A device for producing controlled spacial movement of a first point, said device comprising in combination:

(a) an arm having first and second spaced support portions, said first point being located on said arm;

(b) first swivel bearing means for supporting said arm at said first support portion;

(c) second swivel bearing means for supporting said arm at said second support portion;

(d) first rotary means supporting said first swivel bearing means for causing said first support portion to move along a first circular path, said first rotary means including a first circular disc and first means peripherally engaging said first circular disc to rotatably support said first circular disc;

(e) second rotary means supporting said second swivel bearing means for causing said second support portion to move along a second circular path, said arm having a longitudinal axis that always extends through said first and second circular paths, said second rotary means including second means peripherally engaging said second circular disc to rotatably support said second circular disc in a fixed relationship with said first circular disc;

(f) first means for causing said first rotary means to rotate at a first rate; and

(g) second means for causing said second rotary means to rotate at a second rate.

4,419,042

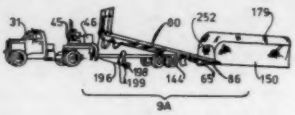
COTTON MODULE TRANSPORT PROCESSES

Floyd W. Reed, P.O. Box 130, Glenn Allan, Miss. 38744

Continuation of Ser. No. 12,146, Feb. 14, 1979, Pat. No. 4,243,353. This application Oct. 8, 1980, Ser. No. 195,105

Int. Cl.³ B60P *1/36*

U.S. Cl. 414—786 **3 Claims**



1. Process of loading an elongated cotton module on a mobile support therefor comprising the steps of tilting the bed of a chain bed relative to a moveable support for said bed and bringing the rear portion of said tilted bed close to but spaced away from the ground to the rear of such tilt bed support and applying the weight of said support to wheels at the end of said tilted bed and removing the weight of said support from other wheels of said support and engaging the ground with the said wheels at the end of said tilted bed and actuating a toothed chain drive means and driving the toothed chain upwards along the tilted bed while said bed is moved toward and along and under the length of said cotton module and a plurality of lift wheels are engaged with successive portions of said module, and moving the chains along said bed at a linear speed equal to the linear traversing movement of said bed relative to said module responsive to the movement of the said bed relative to said ground.

4,419,043

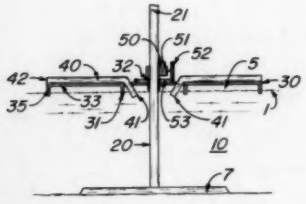
CENTRIFUGAL PUMP

Thomas W. Smith, 2819 Caldwell Blvd. No. 68, Nampa, Id. 83651

Filed Nov. 5, 1981, Ser. No. 318,488

Int. Cl.³ F04D *1/14*

U.S. Cl. 415—7 **3 Claims**



1. A pump comprising:

lateral support means:

a rotatable flotation member vertically moveable in relationship to and laterally supported by said support means, said flotation member including a circular horizontal platform and at least two spaced concentric downwardly depending annular flanges sealingly engaging said platform open-ended flotation air tanks therebetween for rotation of said flotation member on a column of air;

at least one radially extending conduit supported by said flotation member, each of said conduits having an inlet port adjacent the vertical axis of said flotation member and an outlet port on the opposing end thereof; and

drive means for rotating said flotation member.

4,419,044

GAS TURBINE ENGINE

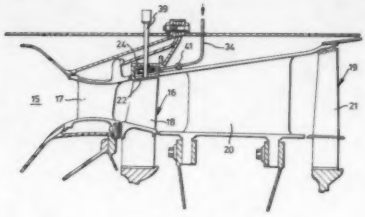
Brian Barry, Duffield; John H. R. Sadler, Aston-on-Trent; Susan M. Allen, Belper, all of England, and David W. Artt, Moira, Northern Ireland, assignors to Rolls-Royce Limited, London, England

Filed Nov. 6, 1981, Ser. No. 318,851

Claims priority, application United Kingdom, Dec. 18, 1980, 8040500

Int. Cl.³ F01D *11/08*

U.S. Cl. 415—117 **10 Claims**



1. A turbine suitable for use in a gas turbine engine having varying operating conditions resulting in changes in temperature of hot gases passing therethrough, said turbine comprising:

an annular array of rotary aerofoil blades having tips, said annular array of aerofoil blades being of a comparatively low mass and having a predetermined rate of thermal expansion and contraction from an increase and a decrease in temperature respectively;

an annular shroud member including a portion defining an annular radially inwardly facing surface and at least one heat pipe defining a major portion thereof, said at least one heat pipe including a sealed container with a condensable vapor therein and capillary means for transporting condensed vapor in liquid form from a cooler area to a hotter area of the sealed container of said at least one heat pipe;

said annular shroud member being located coaxially with and radially outwardly of said rotary aerofoil blades, said tips of said rotary aerofoil blades and said inwardly facing surface of said annular shroud being positioned adjacent each other but radially spaced apart to provide a radial clearance therebetween;

at least one heat pipe having a high thermal conductivity to thereby provide said shroud member with a rapid rate of thermal expansion and contraction dependent upon an increase or decrease in temperature respectively while being substantially isothermal without thermal gradients caused by localized hot spots;

means for maintaining said radial clearance between said tips of said rotary aerofoil blades and said inwardly facing surface of said annular shroud within a predetermined range of values, said maintaining means comprising:

distance measuring means having an output proportional to said radial clearance between said blade tips and said radially inwardly facing surface of said annular shroud;

fluid directing means to direct a temperature regulating fluid onto said at least one heat pipe at least at a position remote from said radially inwardly facing surface of said annular shroud;

flow rate regulating means to regulate the flow rate of said temperature regulating fluid from said fluid directing means onto said at least one heat pipe;

and control means interconnecting said flow rate regulating means and said distance measuring means, said control means reducing the flow rate of the temperature regulating fluid by said flow rate regulating means to said fluid directing means when said radial clearance decreases below the predetermined range of values due to thermal expansion of said annular array of aerofoil blades whereby

said heat pipe is heated up and rapidly thermally expands without distortion thereby maintaining the radial clearance within the predetermined range of values, and said control means increasing the flow rate of the temperature regulating fluid by said flow rate regulating means to said fluid directing means when said radial clearance increases above the predetermined range of values due to thermal contraction of said annular array of aerofoil blades whereby said heat pipe is cooled down and rapidly thermally contracts without distortion thereby maintaining the radial clearance within the predetermined range of values.

4,419,045

METHOD AND DEVICE FOR REDUCING THE NOISE OF TURBO-MACHINES

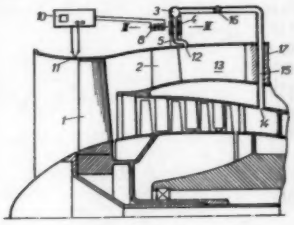
Pierre A. Andre, Paris; Jean-Claude P. H. P. Thevenin, Saint.-Maur-des-Fosses; Jean-Pierre Y. B. Girault, Dammarie les Lys, and Gerhard Richter, Boissise le Roi, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Division of Ser. No. 849,472, Nov. 7, 1977, Pat. No. 4,255,083. This application Jul. 18, 1980, Ser. No. 170,187

Claims priority, application France, Nov. 5, 1976, 76 34065

Int. Cl.³ F04D *29/66*

U.S. Cl. 415—119 **3 Claims**



1. In a turbo-machine which includes an elongated, hollow, stationary outer wall, a rotatable rotor ring mounted centrally inside of said outer wall and comprising an elongated rotor shaft and a number of radial rotor blades extending from said rotor shaft towards said stationary outer wall, and a stationary stator having a number of radial stator vanes extending towards said stationary outer wall, the improvement wherein said turbo-machine includes an apparatus for reducing the noise generated by the interaction of the rotating rotor blades and the stationary stator vanes by creating a counter-noise of opposed phase, this apparatus comprising:

a plurality of injection orifices located in said stationary outer wall and distributed around the circumference thereof, the number of injection orifices being equal to the number of vanes in said stator ring,

means forming a toroidal manifold surrounding said stationary outer wall,

means for supplying a constant flow of fluid to said toroidal manifold,

a plurality of feed pipes distributed around the circumference of said toroidal manifold, each feed pipe interconnecting with a respective injection orifice,

a movable flow regulator shutter in each feed pipe, and

means to move said flow regulator shutter in each feed pipe, each said means to move the flow regulator shutter in each feed pipe including a solenoid, a rod connected between the solenoid and the shutter, at least one sensing device mounted in said stationary outer wall responsive to the passage frequency of said moving rotor blades, and means for supplying electrical current in response to said sensing means to each said solenoid to operate said solenoid and move said rod and the attached shutter in response to on the passage of the rotor blades past the sensing device.

4,419,046

HIGH PRESSURE CENTRIFUGAL FLUID DELIVERY MACHINE

Gerardo P. V. Carlini, Gavilan no 4552, Buenos Aires, Argentina

Filed Jan. 10, 1980, Ser. No. 110,858

Claims priority, application Argentina, May 9, 1979, 37454

Int. Cl.³ F04B *27/00*

U.S. Cl. 415—127 **3 Claims**

1. In a centrifugal fluid delivery machine such as centrifugal pumps or turbo-compressors of the type including a housing, an impeller blade rotor coaxially positioned with an axial inlet of the machine for delivery fluid to the rotor, and a spiral chamber surrounding said housing and communicating an outlet end of the blades of the impeller blade rotor with an outlet of the machine, said impeller blade rotor being formed with an inclined side wall to constitute with said spiral chamber an operating diffusor chamber, the combination comprising: an annular piston member disposed within said housing, said annular piston member including a lateral wall positioned against said side wall of the rotor and having a configuration congruent with that of said side wall, an annular enclosure member formed with an opening communicating with said axial inlet, an outer wall extending between said spiral chamber and said annular enclosure member to form an additional chamber therebetween; and actuating means for moving said annular piston and thus said lateral wall in the axial direction to and from said inclined side wall, said lateral wall of said piston member being so arranged that when said actuating means move said piston in said axial direction to and from said side wall, said lateral wall opens or closes said opening, respectively, and connects said additional chamber to or disconnects said additional chamber from said diffusor chamber respectively, whereby the volume of said diffusor chamber is varied in dependence upon a position of said piston member while maintaining fluid delivery from said inlet constant.

4,419,047

METHOD OF OPERATION OF A PUMP-TURBINE BETWEEN PART-LOAD OPERATION AND REVERSE PUMPING OPERATION

Dieter Klemm, and Peter Ulith, both of Heidenheim, Fed. Rep. of Germany, assignors to Voith GmbH, Heidenheim, Fed. Rep. of Germany

Division of Ser. No. 162,584, Jun. 23, 1980, abandoned. This application Jun. 15, 1982, Ser. No. 388,519

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935480

Int. Cl.³ F01D *17/00*

U.S. Cl. 415—150 **2 Claims**

1. In a pump-turbine having impeller means and a plurality of water flow control gates arranged in circular array around the impeller;

a movable gate operating ring;

connecting means operably connecting said gates to said

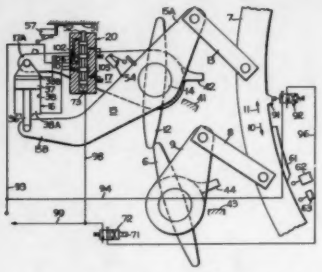
operating ring for effecting the synchronized movement of said gates in opening and closing movements; and,

a first means operably connected to effect the independent movement of at least one of said gates relative to a position that said gate operating ring moves said gate into;

control means for selectively controlling the operation of said first means;

wherein said connecting means for connecting said gate to said operating ring includes a first lever having one end secured to one of said gates, for effecting its movement;

a second lever having a first end connected to said operating



ring and having its second end connectible to the free end of said first lever;

an adjustable connection to connect the free end of said first lever with the second end of said second lever to thereby have said first lever and said second lever move in unison through the operation of said operating ring; and,

means to effect an adjustment in said adjustable connection to move said first lever relative to said second lever to thereby cause said gate to move an additional amount relative to the position that it is moved to by said operating ring.

4,419,048

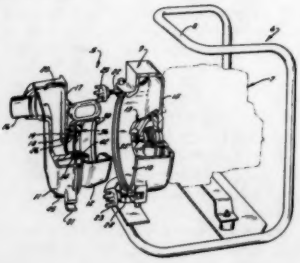
TRASH PUMP WITH RESILIENT LINER

Martin T. Pilachowski, Kewaskum, and Alan J. Ritz, Brookfield, both of Wis., assignors to Wacker Corporation, Milwaukee, Wis.

Filed May 21, 1981, Ser. No. 380,535

Int. Cl.³ F04D *29/40, 7/06*

U.S. Cl. 415—196 **5 Claims**



1. A trash pump having an impeller that has forwardly projecting vanes and is rotatable on an axis to draw liquid rearwardly towards it and propel the liquid radially outwardly, and a shaft by which the impeller is carried and which projects rearward from the impeller for connection with power drive means, said trash pump being characterized by:

A. a housing around the impeller having

(1) an outlet opening in one side thereof,

(2) a large front opening substantially concentric with the shaft, and

(3) a rear wall through which the shaft extends;

B. a volute in the housing wherein the impeller rotates and whereby liquid discharged from the impeller is guided for substantially spiral flow towards said outlet opening in the housing, said volute being removable from the housing through said front opening and having

(1) a rear portion which is adjacent to said rear wall of the housing around the shaft and wherein there is an opening through which the impeller can pass, and

(2) a front wall wherein there is

(a) an inlet opening concentric to the impeller and

(b) a rearwardly opening recess of larger diameter than said inlet opening and concentrically surrounding the same;

C. a cover member detachably secured to the housing at the front thereof as a closure for said front opening and wherein there is a port that is concentric to the impeller;

D. means securing the volute to the rear of the cover member to be removable from the housing with removal of the cover member therefrom, with said inlet opening in the front wall of the volute in register with said port in the cover member; and

E. an annular liner of resilient material in said recess in the volute, having a substantially rearwardly facing surface closely adjacent to the orbit of front edge portions of the vanes of the impeller.

4,419,049

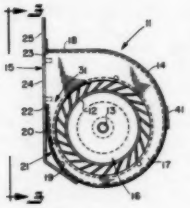
LOW NOISE CENTRIFUGAL BLOWER

Patrick L. Gerboth, Concord Township, Lake County, and Stanley E. Jozwiak, Jr., Mentor, both of Ohio, assignors to SGM Co., Inc., Mentor, Ohio

Continuation of Ser. No. 58,856, Jul. 19, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 312,884

Int. Cl.³ F04D *29/44*

U.S. Cl. 415—206 **2 Claims**



1. A centrifugal blower, comprising generally cylindrical fan wheel means rotatable about its axis for blowing air; housing means for collecting air blown by said fan wheel means, said housing means having a generally spiral shape to direct such collected blown air in a spiral flow path therein, outlet means for receiving such spiral flow of air and for discharging the same from said housing means in a generally straight-line direction, said outlet means comprising a generally planar plate-like member haing a planar cross-section outlet opening therethrough, said housing means having one wall portion terminating relatively far from the spiral center of said housing means, leading to said outlet means, and terminating at said outlet means in generally perpendicular relation thereto, an involute wall portion terminating relatively proximate such spiral center, and an extension wall portion extending from said involute wall portion toward said outlet means, said extension wall portion comprising a linear wall, having an increasing radial spacing from such spiral center in a direction toward said outlet means from at least one of the juncture of said extension

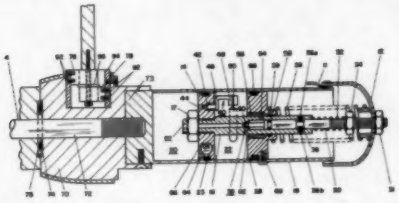
wall portion and said involute wall portion and of a location on said extension wall portion otherwise most proximate such spiral center, not having a spiral extending cut-off, having an end terminating at said plate-like member opening in nearly parallel relation to the plane of said plate-like member, whereby said outlet opening is substantially fully open and unimpeded by a throat-like passage, having a major portion positioned with respect to said fan wheel means and said outlet means so as to avoid impeding air flow in said housing means and exiting the latter and said extension wall portion being generally tangential to said involute wall portion at a juncture of said involute and extension wall portions.

4,419,050

METHOD AND APPARATUS FOR CONTROLLING PROPELLER PITCH

Charles L. Williams, 6 Rowe Ave., Rockport, Mass. 01966

Filed Aug. 18, 1980, Ser. No. 179,047
Int. Cl.³ F01D *7/02*
U.S. Cl. 416—46 **4 Claims**



1. In a variable pitch control system, the combination comprising

a propeller having a radially-extending blade,

means for driving said blade,

pivot means supporting said blade for angular movement about its radial axis whereby the pitch of said blade is varied,

linkage means coupled to said blade and having a predetermined position for each pitch angle of said blade,

means responsive to the rotation of said propeller to produce a first force on said linkage means,

a cylinder assembly having a pressure chamber and a movable piston sealing said chamber,

a reservoir chamber,

a channel communicating with said reservoir chamber and said pressure chamber for carrying fluid between said chambers,

normally closed valve means arranged to prevent flow through said channel,

hydraulic fluid filling said pressure chamber,

coupling means connected to said linkage means and said piston and arranged to apply pressure to said fluid in response to said force,

control means communicating with said chamber responsive to a predetermined r.p.m. of said propeller to reduce the pressure in said chamber thereby to permit said piston to move in response to said force and said propeller to change pitch,

means responsive to a reduction in the r.p.m. of said propeller for opening said normally-closed valve means, and

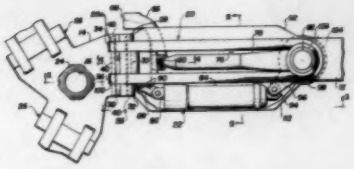
a second valve means arranged to close said channel whenever the pitch of said blade is less than a predetermined angle.

4,419,051

TWIN TENSION/TORSION BEAM ROTOR SYSTEM

Richard T. DeRosa, Brookhaven, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 16, 1982, Ser. No. 348,889
Int. Cl.³ B64C *27/38*
U.S. Cl. 416—140 **14 Claims**



1. A rotor system for mounting rotor blades to a helicopter, comprising:

a rotor hub having at least two sets of mounting lugs, each set including a plurality of adjacent lugs each containing an aperture;

a support fitting for each set of mounting lugs, each said support fitting including a plurality of adjacent lugs each containing an aperture,

each set of mounting lugs and the lugs of a respective support fitting being engaged such that their respective apertures are aligned to receive a hinge pin forming thereby a flap hinge;

a plurality of elongated blade pitch varying means each connected at one end to a respective support fitting, and each defining a clevis for receiving a rotor blade securing pin forming thereby a fold hinge; and

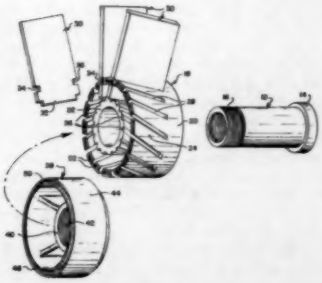
a compound curved, continuous loop twin tension/torsion beam, double wrapped around the flap hinge at one end and double wrapped around the fold hinge.

4,419,052

TURBINE METER ROTOR

Johann A. Stamm, Export, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 119,343, Feb. 9, 1980. This application Mar. 11, 1982, Ser. No. 357,104
Int. Cl.³ F01D *5/30*
U.S. Cl. 416—214 A **15 Claims**



1. A fluid meter having a housing with inlet and outlet openings, a rotor, including vanes, rotatably supported in said housing to be driven by fluid flow therethrough, an improved rotor construction including:

(a) a rotor hub rotatably mounted on a shaft having an axis parallal to the direction of fluid flow;

(b) a vane hub mounted on said rotor hub and having a main

body portion with radially spaced inner and outer axially extending cylindrical walls concentric with the axis of rotation of said rotor hub;

(c) substantially axially extending recesses in said inner wall to receive the ends of vanes;

(d) substantially axially extending recesses in said outer wall in radial alignment with said recesses in said inner wall;

(e) said recesses in said inner and outer walls respectively opening to corresponding ends of said inner and outer walls;

(f) a plurality of vanes each of which has an end supported in a recess in said inner wall and an intermediate portion supported in a corresponding recess in said outer wall;

(g) retaining means attached to the end of said rotor hub corresponding to said ends of said walls to hold said vanes in said recesses.

4,419,053

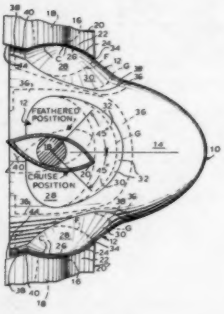
PROPELLER SPINNER

Edward J. Swearingen, Jr., San Antonio, Tex., assignor to Fairchild Swearingen Corporation, San Antonio, Tex.

Filed Nov. 20, 1981, Ser. No. 323,178

Int. Cl.³ B64C *11/14*

U.S. Cl. 416—234 **7 Claims**



1. Propeller apparatus comprising a propeller spinner having a plurality of spaced protruding surfaces attached to and extending radially outward from the exterior surface of said spinner and an exterior substantially continuous surface except for said protruding surfaces that lacks any substantial depressions, a plurality of variable pitch propeller blades extending radially outward from said spinner through the protruding surfaces of said spinner, said propeller blades each having a long central axis and having a root end portion located outside the exterior surface of said spinner adjacent to the protruding surfaces of said spinner, said root end portion comprising a propeller cuff or a blade portion with an airfoil section, and means located on the root end portion adjacent to the protruding surface of said spinner and on the protruding surface of said spinner for reducing drag between said root end portion and the protruding surface of said spinner while the pitch of said variable pitch propeller blades is varied through at least a portion of the forward operational pitch range of said propeller blades comprising means for eliminating any substantial gap between at least a portion of the protruding surface of said spinner, said gap eliminating means comprising a portion of the protruding surface being curved in three dimensions to form substantially a portion of a sphere with a radius which pivots about a point on the centerline of the central long axis of the propeller blade having a portion thereof located adjacent to the substantially continuous exterior surface of said propeller spinner and the exterior surface of a portion of the root end portion being curved to substantially match the curvature of the adjacent substantially spherical shaped portion of the protruding surface, wherein said protruding surface has a forward sloping portion and the forward portion of the spherical portion terminates at a juncture where the forward portion of the spherical portion intersects the forward sloping portion.

4,419,054

LIQUID FUEL INJECTION PUMPING APPARATUS

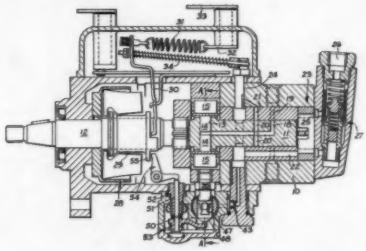
Stanislaw J. A. Sosnowski, London, and Robert T. J. Skinnger, High Wycombe, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed May 7, 1981, Ser. No. 261,150

Claims priority, application United Kingdom, Jul. 2, 1980, 8021634

Int. Cl.³ F04B *19/02, 29/00*

U.S. Cl. 417—294 **9 Claims**

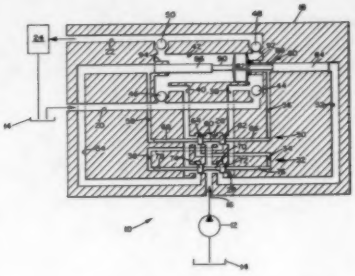


1. A liquid fuel injection pumping apparatus comprising a body, a rotary distributor member in the body, a drive shaft coupled to the distributor member and arranged in use to be driven in timed relationship with an associated engine, a bore in the distributor member, a plunger in the bore, an annular cam ring surrounding the distributor member and having cam lobes which impart inward movement to the plunger as the distributor member rotates, fluid pressure operable piston means for varying the angular setting of the cam ring about the axis of the distributor member to vary the timing of delivery of fuel by the apparatus, a pump for supplying liquid under pressure to a cylinder containing said piston means, the pressure of liquid supplied by said pump being arranged to vary in accordance with the speed of operation of the apparatus, a governor mechanism including a centrifugal weight unit mounted in the body, the governor mechanism further including an axially movable output member which is movable by said weight unit in opposition to the force exerted by a governor spring, a linkage connecting said output member to a fuel control member the setting of which determines the amount of fuel delivered by the apparatus at each delivery stroke, said piston means comprising a piston, a bore formed in said piston, a servo valve slidable in said bore, said servo valve being subject to the pressure of liquid delivered by the low pressure pump, an axially movable member in said bore, a spring engaging said axially movable member to bias the servo valve against the action of the liquid under pressure, a land on said servo valve, a port formed in the wall of said bore, said port communicating with one end of said cylinder, said land cooperating with said port to control the flow of liquid through the port, to determine the position of the piston in the cylinder, and means coupled to the output member of the governor mechanism for altering in accordance with the position of the output member, the distance between the portion of the land which is cooperating with the port and said axially movable member.

4,419,055
LOW PRESSURE FLUID SUPPLY SYSTEM

Ronnie F. Burk, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 26, 1980, Ser. No. 191,659
Int. Cl.³ F04B 17/00
U.S. Cl. 417—396 2 Claims



1. A low pressure fluid supply system connectible to a high pressure fluid source, to a low pressure function and to a non-pressurized fluid reservoir, said low pressure fluid supply system comprising:

(a) a pump body;

(b) a main bore enclosed within said pump body having a first and a second end;

(c) first and second bores enclosed within said pump body having respective first and second ends;

(d) a high pressure inlet into said pump body connecting said high pressure fluid source to said first and second bores between said respective first and second ends thereof;

(e) first and second pilot passages enclosed within said pump body respectively connecting said first bore proximate said first end to said second end of said second bore, and connecting said first bore proximate said second end to said first end of said second bore;

(f) first and second main passages enclosed within said pump body respectively connecting said second bore proximate said first end to said first end of said main bore, and connecting said second bore proximate said second end to said second end of said main bore;

(g) first and second control passages enclosed within said pump body respectively connecting said first and second ends of said first bore to said first and second main passages approximately at said ends of said main bore;

(h) first and second relief passages enclosed within said pump body respectively connecting said first end of said main bore to said first ends of both said first and second bores, and connecting said second end of said main bore to said second ends of both said first and second bore;

(i) a reservoir passage enclosed within said pump body connecting said non-pressurized fluid reservoir to both said first and second ends of said main bore;

(j) a low pressure passage enclosed within said pump body connecting said low pressure function to both said first and second ends of said main bore;

(k) first and second check valve means respectively disposed in said first and second ends of said main bore for preventing fluid from flowing from said main bore into said reservoir passage;

(l) third and fourth check valve means respectively disposed in said first and second ends of said main bore for preventing fluid from flowing from said low pressure passage into said main bore;

(m) first spool means positioned within said first bore and extending into both said first and second control passages, said first spool means movably responsive to high pressure fluid in said first control passage thereby connecting said high pressure fluid source to said first pilot passage and connecting said first relief passage to said second pilot passage; and movably responsive to high pressure fluid in said second control passage thereby connecting said high pressure fluid source to said second pilot passage and connecting said second relief passage to said first pilot passage;

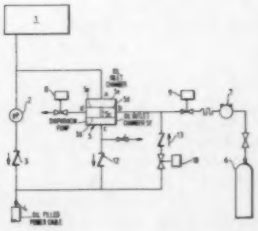
(n) second spool means positioned within said second bore and extending into both said first and second pilot passages, said second spool means movably responsive to high pressure fluid in said first pilot passage thereby connecting said high pressure fluid source to said first main passage and connecting said second relief passage to said second main passage, and movably responsive to high pressure fluid in said second pilot passage thereby connecting said high pressure fluid source to said second main passage and connecting said first relief passage to said first main passage; and

(o) free piston means positioned within said main bore and extending in said first and second main passages, said free piston means for responding to high pressure fluid in said first main passage to move from a first position connecting said first control passage to said non-pressurized fluid reservoir and said second main passage to said low pressure fluid function through a series of positions for drawing fluid from said non-pressurized fluid reservoir through said first check valve means into said main bore and for urging fluid out of said main bore through said fourth check valve means to said low pressure fluid function while respectively blocking said first and second control passages from said non-pressurized fluid reservoir and said low pressure fluid function to a second position connecting said first control passage to said high pressure fluid source and said second main passage to said low pressure fluid function, said free piston means responsive to high pressure fluid in said second main passage to move from said second position through a series of positions to said first position thereby drawing fluid from said non-pressurized fluid reservoir through said second check valve means into said main bore and for urging fluid out of said main bore through said third check valve means to said low pressure fluid function.

4,419,056
BACK-UP FOR HIGH VOLTAGE CABLE PRESSURIZING SYSTEM

Sigmund Ege, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 22, 1981, Ser. No. 285,700
Claims priority, application Norway, Aug. 4, 1980, 802327
Int. Cl.³ F04B 23/04, 43/06
U.S. Cl. 417—426 20 Claims



1. In a system for pressurizing oil filled power cables including an electrical insulating oil source coupled to said power cables to fill said power cable with said oil and to maintain oil pressure in said power cable, a back-up system to supply said oil to said power cable in case of a rupture of said power cable causing oil leaks comprising:

a reservoir of said oil;

at least one diaphragm-type pump having two spaced diaphragms interconnected by a rod, a gas drive input and a gas drive output coupled to a first chamber disposed between said two diaphragms, a suction input coupled to said oil reservoir and to a second chamber adjacent one of said two diaphragms and an oil output coupled to said power cable and to a third chamber adjacent the other of said two diaphragms, said back-up system having a normal stand-by mode of operation when said power cable is not ruptured, a test mode of operation to enable testing of said diaphragm pump and an operate mode of operation when said rupture occurs; and

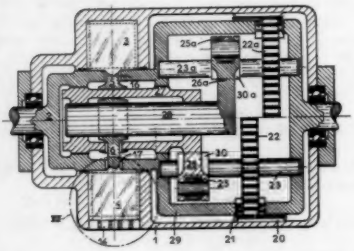
a first arrangement coupled to said drive input to provide said oil in said first chamber during at least said stand-by mode of operation, said second chamber being coupled to said oil reservoir during all operating modes such that said second chamber and said first chamber have said oil therein simultaneously during at least said stand-by mode of operation.

4,419,057

ROTARY PISTON MOTOR

Claude C. F. Menioux, Nogent sur Marne, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", Paris, France

Filed Feb. 3, 1981, Ser. No. 231,107
Claims priority, application France, Feb. 6, 1980, 80 02539
Int. Cl.³ F01C *1/077*
U.S. Cl. 418—36 **14 Claims**



1. An internal combustion rotary volumetric motor operating on a four stroke cycle, comprising:

a fixed exterior housing which delimits an annular space;

a plurality of pistons that rotate in the same direction mounted in said annular space;

a rod having a shaft integral therewith diametrically connecting said pistons in pairs and propelling said pistons by a cyclical speed variation which causes a volume variation in the space delimited by radial surfaces of the pistons, said spaces between the pistons forming chambers of said motor operating on a four stroke cycle;

a rotary crown having a plurality of ports formed therein wherein the annular space within which the pistons move is delimited by the housing and said rotary crown having said ports through which the rods are engaged and which provide an angle of clearance for the rods for advancing and receding of the pistons, said rotary crown forming part of an outlet motor shaft; and

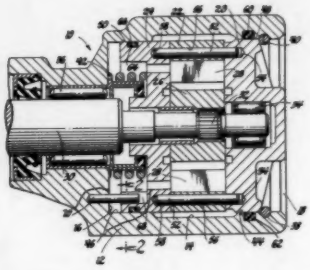
a transmission mechanism attaching said rotary crown to the shafts.

4,419,058

HYDRAULIC PUMP ROTATING GROUP AXIAL ALIGNMENT STRUCTURE

Leonard N. Franklin, Jr., Reese, and Gary G. Hegler, Chesaning, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1981, Ser. No. 271,661
Int. Cl.³ F04C *2/00, 15/00*
U.S. Cl. 418—133 **2 Claims**



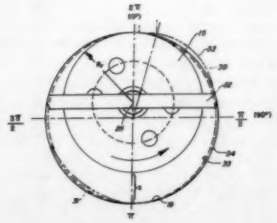
1. A vane pump assembly comprising; a housing, a pressure plate piloted in said housing; a cam ring disposed in said housing adjacent said pressure plate; a thrust plate piloted in said housing adjacent said cam ring; a pair of alignment dowel pins each extending from a close fit in a blind opening in said pressure plate, through a close fit opening in said cam ring and into a close fit blind opening in said thrust plate to maintain axial and angular alignment of said plates and ring; and reaction means extending between said housing and said pressure plate in a loose fit relation in at least the circumferential direction for limiting rotary motion of said pressure plate relative to said housing, and through the alignment pins also limiting rotation of the thrust plate and cam ring.

4,419,059

NONSYMMETRIC BORE CONTOUR FOR ROTARY COMPRESSOR

Vincent P. Anderson, Knight Township, Vanderburgh County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 10, 1981, Ser. No. 291,791
Int. Cl.³ F04C *18/00*
U.S. Cl. 418—150 **11 Claims**



1. In a rotary compressor having a wall defining a compression chamber having a discharge opening, a cylindrical rotor eccentrically positioned in said chamber and defining a center and a diametric slot, said rotor engaging the chamber wall at a point of contact adjacent the outlet passage, an onepiece blade longitudinally reciprocably slidably received in said slot and having opposite projecting tips each having a center of curvature on the longitudinal centerline of the blade and being in

sliding contact with the chamber wall for substantially all rotational positions of the rotor, said wall having a contour generally defined by the formula $R(\theta)=R_0+R_1\cos(\theta)$, where $R(\theta)$ is the distance from the center of the rotor to the center of the blade tip radius, R_0 is the radius of the rotor minus the blade tip radius plus one-half the distance ("a") between the rotor and the chamber wall at the point opposite the contact point, and

$$R_1 = -\frac{a}{2},$$

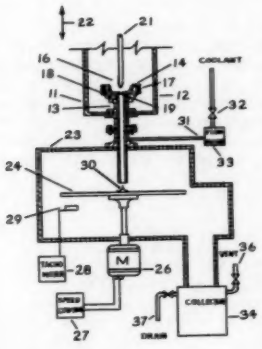
and wherein the wall is further defined by a radially outward enlargement of said contour in the quadrant of the chamber containing said discharge opening and radially inward reduction of said contour in the opposite quadrant of the chamber.

4,419,060

APPARATUS FOR RAPIDLY FREEZING MOLTEN METALS AND METALLOIDS IN PARTICULATE FORM

John L. Speier, and Donald T. Liles, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 14, 1983, Ser. No. 474,780
Int. Cl.³ B01J 2/14
U.S. Cl. 425—8 **6 Claims**



1. In an apparatus for rapid freezing of metals and metalloids in particulate form from a melt of such materials having a disc-like member mounted substantially horizontally on a centrally located shaft connected to a high rotatable speed power source and inlet means for introducing both a volatile liquid coolant and the molten material to be processed to the disc-like member as it is rotated whereby the molten material is cooled to the solid state by vaporization of the liquid coolant and dispersed by centrifugal forces acting upon the coolant and material, the improvement which comprises:

a generally cone-shaped protrusion located with its apex extending upwardly from the center of rotation of the disc-like member,

the inlet means for the molten materials being located vertically above the apex of the protrusion, and

the inlet means for said liquid coolant being located sufficiently close to said inlet means for said molten materials to provide cooling for said protrusion and to provide an outwardly flowing film of coolant liquid across the upwardly facing surface of said disc-like member,

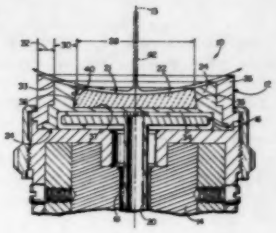
whereby the molten material dropped to the apex of said protrusion is dispersed thereby into said film of coolant liquid.

4,419,061

MULTI-PIECE ROTARY ATOMIZER DISK

Robert J. Patterson, II, Port St. Lucie, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,189
Int. Cl.³ B28B 1/54
U.S. Cl. 425—8 **8 Claims**



1. Rotary atomization means for atomizing molten metal, including a drive shaft having an axis and a cylinder-like atomizer disk mounted on said drive shaft for rotation about said axis, said disk having an upper atomizer surface, the improvement comprising:

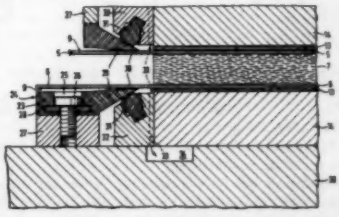
said disk comprising at least three elements concentric about said axis, each defining one of a similar number of contiguous, concentric, radially aligned zones of disk material, said concentric zones defining said upper atomizer surface, one of said elements being a central element and defining a central zone of said concentric zones and having a low thermal conductivity, said elements surrounding said central element being made from a high thermal conductivity material, the radially outermost of said elements also being made from a high tensile strength material.

4,419,062

CONTINUOUS OPERATION PRESS

Albert de Mets, Roeselaare, Belgium, assignor to de Mets N.V., Tzegem, Kachtem, Belgium

Filed Nov. 16, 1981, Ser. No. 321,608
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 35065
Int. Cl.³ B30B 5/06
U.S. Cl. 425—101 **32 Claims**



1. A continuous-operation press for at least one of producing and treating a board web, the press including an upper and lower belt means defining upper and lower carrying runs between which the board web is carried, the upper and lower belts being adapted to continuously circulate at a constant speed, characterized in that support means extending substantially perpendicular to a conveying direction of the board web is provided and extends over an entire width of a press area of the press, the support means is disposed in proximity to an underside of the lower belt, a friction reducing means is ar-

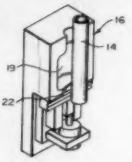
ranged on the support means with the underside of the lower belt resting thereon, means are provided for supplying a lubricant to the friction reducing means, and in that a seal means is fixedly mounted on the press at least in a vicinity of an exit to the press area as viewed in a direction of conveyance of the board web, the seal means extends over an entire width of the press area.

4,419,063

BLOW MOLDING DETABBER

Brooks B. Heise, 14 Westminster Dr., West Hartford, Conn. 06107

Filed Mar. 8, 1982, Ser. No. 356,220
Int. Cl.³ B29C *17/07, 17/12*
U.S. Cl. 425—107 **8 Claims**



1. Apparatus for use with a blow molding machine to remove a tab formed at one end of a blow-molded object and comprising a mold defining the shape of the object to be blow-molded, a carriage having a fixed frame secured to the mold and a slide supported for movement on the frame, a first jaw and a cooperating second jaw, each jaw being associated with one half of the mold, the first jaw being supported by the carriage slide for movement from a position juxtaposed with the bottom of the mold to a position spaced therefrom, the slide including an axle with rollers at opposite ends, the fixed frame providing a pair of recessed cam grooves embracing the rollers to guide the first jaw for movement in a substantially rectilinear path from a first position juxtaposed with the mold and in close contact with the cooperating second jaw to a second position spaced from the mold and from the cooperating second jaw, and passageways defined in the axle in isolated relation to the first jaw and to the blow-molded object having the tab which is to be removed, the passageways serving to admit lubricant for said rollers and cam grooves.

4,419,064

APPARATUS FOR PRODUCING MOLDED PLASTIC ARTICLES SUCH AS PACKAGING TUBES

Karl Mägerle, Im vorderen Erb 1, 8700 Kusnacht, Switzerland

Division of Ser. No. 165,396, Jul. 2, 1980, Pat. No. 4,352,775. This application Apr. 2, 1982, Ser. No. 364,792
Claims priority, application Switzerland, Jul. 12, 1979, 6502/79
Int. Cl.³ B29D *23/04*
U.S. Cl. 425—256 **1 Claim**

1. Apparatus for producing a molded article from thermoplastic material, comprising:

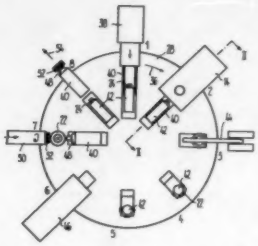
an extrusion head for extruding plasticized thermoplastic material in a vertically downwardly directed annular flow, so that the extruded plasticized thermoplastic material freely depends from said extrusion head;

said extrusion head including means for shaping the plasticized thermoplastic material that is being extruded in said vertically downwardly directed annular flow into a blank of lenticular, standing oval-resembling longitudinal cross-sectional profile, said shaping means including means for controlling said annular flow while said extruded plasticized material freely depends from said extrusion head;

means for separating said blank, so shaped, from the extrusion head, at least in part by terminating said annular flow;

an upwardly open mold cavity disposed spacedly directly beneath said extrusion head, so that as said blank is separated from the extrusion head, said blank free falls into and lands in the mold cavity with minimal surface contact with the mold cavity;

said mold cavity including an axially directed pin which projects vertically upwardly, so that as said blank free falls



into and lands in the mold cavity, said blank spacedly rings said pin;

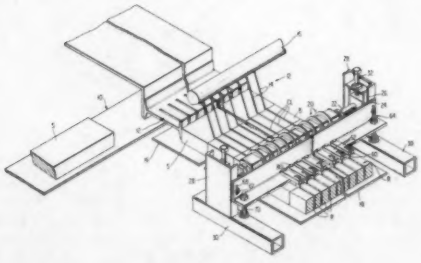
stamp means movable towards the mold cavity into pressing engagement with said blank so as to form a molded article of the extruded plasticized thermoplastic material of said blank while temporarily closing said mold cavity.

4,419,065

METHOD AND APPARATUS FOR SHAPING THE EDGES OF GREEN BRICK AND SEPARATING THE SAME

Joseph A. Cox, Fletcher, N.C., assignor to EA Industries, Incorporated, Asheville, N.C.

Filed Aug. 15, 1980, Ser. No. 178,537
Int. Cl.³ B28B *11/08*
U.S. Cl. 425—301 **17 Claims**

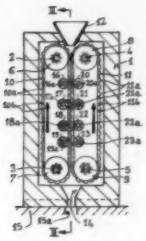


1. In combination with apparatus for cutting slugs into rows of green bricks including a wire cutter having a plurality of horizontally spaced fixed generally vertical wires extending across a path of conveyance in side-by-side relationship, means for shaping the edges of the bricks after leaving the wire cutter including a plurality of rollers mounted for rotation about a horizontal axis extending across the path of conveyance, the rollers being position along said axis at fixed locations aligned with said wires, respectively, such that peripheral portions of each roller will simultaneously engage the adjacent edges of adjacent bricks to shape the same, and wherein said rollers have means on their peripheral portions for shaping the edges of the bricks, and wherein the apparatus further includes cutting means positioned along the path of conveyance downstream of the rollers for cutting portions of the bricks located between adjacent rows of bricks for separating the rows of bricks from each other.

4,419,066
MACHINE FOR CONTINUOUSLY DENSIFYING LIGNO-CELLULOSIC OR LIKE MATERIALS

Marcel Neuman, Embourg, Belgium, assignor to Biomass Development S.A., Zurich, Switzerland

Filed Oct. 27, 1981, Ser. No. 315,442
Claims priority, application France, Oct. 28, 1980, 80 23419
Int. Cl.³ A01J *21/00*
U.S. Cl. 425—371 4 Claims



1. A machine for continuously compacting ligno-cellulosic materials, comprising:

(a) a frame having an inlet at one end and an outlet at the other end;

(b) a pair of mutually spaced parallel shafts supported in the frame near its inlet, and a pair of mutually spaced parallel shafts supported in the frame near its outlet;

(c) two pairs of drums respectively carried by the paired shafts within the frame, and means to drive at least one of said drums;

(d) two elastomeric toothed belts, each respectively carried by two drums comprising one of the drums at each end of the frame, the belts having inner surfaces engaging the drums and having opposed outer toothed surfaces with the teeth of each belt meshed in the valleys of the opposed belt to synchronize travel of the belts;

(e) multiple pairs of opposed compression rollers journaled to rotate about their axes in the frame, and being disposed in sequentially adjacent pairs of rollers which are spaced along the belts, and the rollers in each pair being disposed to contact the inner surfaces of the belts respectively on opposite sides of their opposed and meshed toothed surfaces;

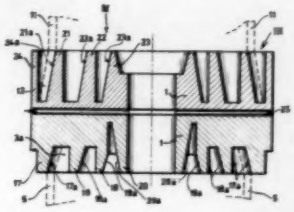
(f) means for introducing said materials between the belts and drums at said inlet end, whereby the materials travel between said toothed and meshed belt surfaces and are discharged therefrom at said outlet end; and

(g) the compression rollers of each pair being operatively located to compress the elastomeric belts and compact the materials passing between them, and adjacent pairs of rollers being spaced apart to leave uncompressed intervals of belt travel therebetween, whereby alternate pulsating compression and expansion of the belts and materials occurs successively as the belts travel between the pairs of rollers and through the intervals therebetween.

4,419,067
DEVICE FOR CONNECTING PLASTICS TUBES BY HEATSEALING

Jurgen Graafmans, Ibbenburen, Fed. Rep. of Germany, assignor to Wavin B.V., Zwolle, Netherlands

Division of Ser. No. 882,400, Mar. 1, 1978, abandoned, Ser. No. 111,172, Jan. 10, 1980, abandoned, and Ser. No. 257,187, Apr. 24, 1981, abandoned. This application Jun. 24, 1982, Ser. No. 391,724
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2708898
Int. Cl.³ B29C *17/00*
U.S. Cl. 425—392 2 Claims



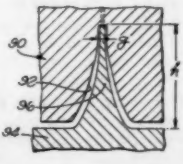
1. An apparatus for connecting plastic tubes by heat sealing, comprising a plate with at least one heatable widening mandril forming a funnel shaped widening, one side of said plate comprising second annular sections having truncated conical outer walls which widen toward the exterior, the opposite side of said plate comprising first annular sections having inner truncated conical surfaces which taper toward the interior, whereby the smallest diameter of an inner conical surface at the inner extreme end of an annular section is equal to the smallest outer diameter at an outward extremity of an annular section at the opposite side of the plate, the top angle of said second annular conical outer walls [21A] to [24A] of said second annular sections [21], [22], [23], [24] and of the conical inner walls [17A], [18A], [19A] and [20A] of said first annular sections [17], [18], [19], [20] being comprised between 20 and 60 degrees and means connected to simultaneously heat said first and second annular sections.

2. The apparatus of claim 1 wherein there is an insulating layer in between the external part of the truncated conical surfaces and the internal part of the truncated conical surfaces.

4,419,068
MOLDING APPARATUS HAVING A VENTED FEMALE MOLD MEMBER FOR FORMING FOAMED EGG CARTONS

Wayne L. Congleton, Walnut, Calif., assignor to Dolco Packaging Corporation, Sherman Oaks, Calif.

Division of Ser. No. 235,203, Feb. 17, 1981, Pat. No. 4,382,536. This application Mar. 11, 1982, Ser. No. 356,998
Int. Cl.³ B29C *17/03*; B29D *27/00*
U.S. Cl. 425—398 1 Claim



1. A mold for molding a flexible portion in a polystyrene sheet having an expanded foam layer with a nonexpanded polystyrene skin on one side of the foam layer, comprising:

a female mold member having a vented indenture with an outer surface;

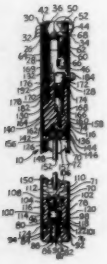
a male mold member having a protrusion with an outer surface, the protrusion adapted for being intermittently inserted into the indenture with a mold gap between the outer surface of the protrusion and the outer surface of the indenture, wherein the protrusion comprises an upstanding rib with a top edge having at least one corner notched for decreasing the amount by which the skin of a polystyrene sheet placed between the male and female mold members is stretched adjacent the notched corner region whereby the skin is stretched without separating.

4,419,069

FLAME IGNITER

Rodney S. Piffath, Sunland, Calif., assignor to Firelite Products Inc., Alhambra, Calif.

Filed Jul. 31, 1980, Ser. No. 174,273
Int. Cl.³ F23Q *2/16*
U.S. Cl. 431—89 **30 Claims**



1. A flame igniter including:

a chamber for containing liquified gaseous fuel having a top and a bottom;

gaseous fuel ignition means;

on/off fuel regulator means positioned closer to the top of said chamber than the bottom thereof; and

a relatively long, thin, fuel feed tube having a fuel inlet end adjacent said bottom of said chamber and a fuel outlet end which extends to said on/off fuel regulator means, said chamber being defined by:

a body tube having top and bottom ends;

a bottom plug positioned in said bottom end of said body tube; and

a top plug positioned in said top end of said body tube constructed from elastomeric material having a mechanical memory, said top plug having said on/off fuel regulator means positioned therein and defining a passageway for fuel from said feed tube to said on/off fuel regulator means, said on/off fuel regulator means including:

a valve needle having a threaded portion and a frustroconical needle portion;

a threaded portion of said top plug for threaded engagement with said threaded portion of said valve needle; and

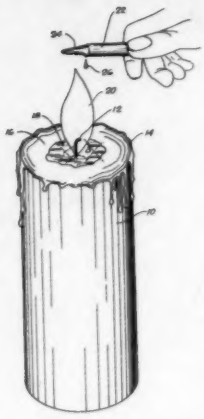
a cylindrical surface defined in said top plug positioned for engagement with said frustroconical needle portion which selectively allows and regulates fuel flow therepast.

4,419,070

DECORATIVE MOLTEN WAX DISPLAY

Alexander Z. Gustafson, Chicago, Ill., assignor to Chicago Digital Incorporated, Chicago, Ill.

Filed Apr. 2, 1981, Ser. No. 250,419
Int. Cl.³ F21Q *3/00*; F23Q *2/32*
U.S. Cl. 431—126 **4 Claims**



1. The method of producing a decorative molten wax display comprising the steps of igniting a wick to burn the wax in a wax impregnated wick of a candle to produce a flame, said candle having the wick surrounded by a mass including wax of a particular color, said mass having an upper substantially horizontal surface extending a distance of at least ¾ inch from the wick to the perimeter of the surface, establishing a pool of molten wax in the surface about the wick of the burning candle, said pool extending from the wick and being spaced from the perimeter of the surface, melting a portion of a wax crayon containing metallic particles of a color different than the color of the wax of the candle in the flame of the candle to produce drops containing molten wax of the crayon and particles of the crayon, and directing the drops from the crayon into the pool of the candle to release the metallic particles from the drops into the pool, and observing the movement of the particles in the pool so as to determine the path of currents of molten wax in the pool, said path of currents forming decorative color patterns for observation at the same time.

4,419,071

PORTABLE HIGH-FLOW RATE FLARE FOR SMOKELESS BURNING OF VISCOUS LIQUID FUELS

Robert Schwartz, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Aug. 3, 1981, Ser. No. 289,299
Int. Cl.³ F23B *5/00*
U.S. Cl. 431—202 **11 Claims**

1. A portable, multi-burner flare for burning of combustible liquid fuel of widely different viscosity, comprising:

a framework for supporting in a vertical array;

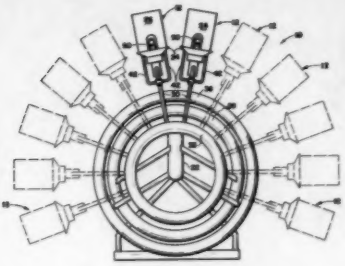
(a) a liquid fuel manifold in the form of at least a portion of a circle, a plurality of first pipes extending along an outward axis from said manifold at spaced locations;

(b) a plurality of burner heads mounted on the ends of said first pipes; each of said burner heads having an orifice and means to atomize and direct said liquid fuel through said burner heads from said manifold along said outward axis;

(c) a water manifold parallel and coaxial with said liquid fuel manifold, a plurality of second pipes extending outward of said water manifold, a water spray nozzle connected to each of said second pipes and positioned so that its axis is

directed toward said outward axis at a selected distance downstream from said burner head;

(d) a gas manifold parallel to and coaxial with said liquid fuel and said water manifolds, a plurality of third pipes spaced



along said gas manifold, and means to connect to pilot burners each of said third pipes which are positioned in the vicinity of said burner heads; and

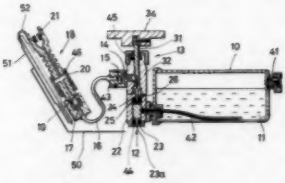
(e) means to supply pressurized liquid fuel, water and gas, to said respective manifolds.

4,419,072

HANDY TORCH

Katsuyuki Nakagawa, Osaka, and Naoki Oda, Ashiya, both of Japan, assignors to Sankin Industry Co., Ltd., Osaka, Japan

Filed Mar. 10, 1982, Ser. No. 356,902
Int. Cl.³ F23Q *3/00*
U.S. Cl. 431—266 **8 Claims**



1. A handy torch comprising:

a tank (10) for containing fuel gas (11) therein in a liquefied state;

a first valve mechanism (12) fixed to the tank (10);

a second valve mechanism (13) connected to the first valve mechanism (12);

a burner (18) having a nozzle (21) at its tip portion and an air-intake opening (20) at its intermediate portion where air is mixed with vaporized gas coming from the second valve mechanism (13);

a pipe (16) for connecting the second valve mechanism (13) with the burner (18);

the first valve mechanism (12) including:

a first valve body (22) having a cylindrical inner wall, a female thread formed in the cylindrical inner wall and a valve seat formed in the first valve body (22);

an actuating member (23) having a male thread screwed with the female thread of the first valve body (22) with a small gap for gas flow;

a disc (25) positioned downstream of the male thread of the actuating member (23);

the disc (25) being set to be moved by the inner end of the actuating member (23) along the cylindrical inner wall in the first valve body (22) in its longitudinal direction with a small gap between the periphery of the disc and the cylindrical inner wall of the first valve body (22) so that the gas can flow through the gap; and

a resilient O-ring (24) disposed between the valve seat and the disc (25) and positioned downstream of the disc (25);

the O-ring (24) being designed such that the gas flowing from an entrance of the first valve mechanism (12) can be controlled by the O-ring (24) in cooperation with the disc (25) and the valve seat in such a manner that the gas can be completely vaporized downstream of the O-ring;

the actuating member (23) having a driven portion (23*a*) for turning the actuating member (23) in a desired direction;

a suction material (42) arranged through the entrance of the first valve mechanism (12) for feeding the gas from the tank (10) to the male thread of the actuating member (23);

the second valve mechanism (13) including:

a second valve body (32) having therein a passage formed form an entrance of the second valve mechanism (13) connected with the exit of the first valve mechanism (12) to an exit of the second valve mechanism (13) connected with the pipe (16), and a through-hole formed with a female thread; and

a needle (31) having at its intermediate portion a male thread screwed with the female thread of the second valve body (32) for controlling the gas flowing through the passage;

a gas adjusting dial member (34) fixed to the needle (31) so that the needle (31) can be turned to move forwards or backwards when the gas adjusting dial member (34) is turned;

a piezo-electric unit (53) having an ignition button (53*a*);

an ignition plug (52) placed near the nozzle (21) and electrically connected to the piezo-electric unit (53);

means (46) for regulating air to be introduced into the air-intake opening (20);

an air control lever (47) for actuating the regulating means (46); and

a casing (60) housing therein at least partly the tank (10), the first valve mechanism (12), the second valve mechanism (13), the pipe (16), the piezo-electric unit (53), the burner (18) and the air control lever (47), and having a gripped portion (60*a*) adapted to be gripped by hands;

the gas adjusting dial member (34), the air control lever (47) and the ignition button (53*a*) being arranged near the gripped portion (60*a*) of the casing (60);

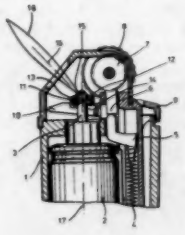
the nozzle (21) being inclined outwardly at an angle between 30 degree and 75 degree in respect of the longitudinal direction of the torch.

4,419,073

GAS LIGHTER

Alfred Racek, Seitenberggasse 54, 1160 Wien, Austria

Filed Jun. 2, 1981, Ser. No. 269,723
Int. Cl.³ F23Q *2/16*
U.S. Cl. 431—344 **1 Claim**



1. A gas lighter for emitting a flame angled away from an ignition device thereof, said ligher comprising:

a housing having a gas tank;

a burner tube in said housing centered on an upright axis and communicating with said gas tank, said burner tube being

formed at the upper end thereof with a flat collar having an upper annular surface lying transverse to said axis and a lower annular surface parallel to said upper annular surface;

a flat annular seal provided on said upper surface of said collar; and

a stamped burner cap provided at the upper end of said burner tube and enclosing said seal, said cap having an upwardly converging conical portion centered on said axis and surrounded by a flat base portion lying parallel to said collar and bearing on an upper surface of said seal, said base portion having a downwardly extending skirt lying parallel to said axis and surrounding said collar, said skirt being formed with inwardly bent shoulders engaging beneath the lower surface of said collar, said conical portion of said cap being formed with a gas orifice at an angle to said axis.

4,419,074

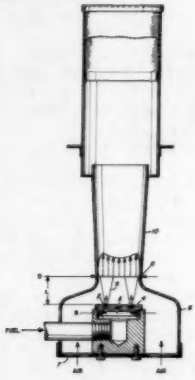
HIGH EFFICIENCY GAS BURNER

Mark A. Schuetz, Belmont, Mass., assignor to Advanced Mechanical Technology, Inc., Newton, Mass.

Filed Sep. 11, 1981, Ser. No. 301,296

Int. Cl.³ F23D *13/40*; F04F *5/46*

U.S. Cl. 431—354 **8 Claims**



1. A burner assembly having a flame holder and a nozzle assembly for injecting a gaseous fuel from line pressure of 1070 Pascal or less through a throat into a diffuser to aspirate and mix with an amount of air sufficient for complete combustion of the fuel at the flame holder, the burner assembly comprising:

a nozzle assembly having a plurality of nozzles in a generally circular array, the nozzles being angled about 10° relative to the axis of the nozzle assembly and throat to provide swirl of the air fuel mixture, the fuel and aspirated air flowing directly into the throat as a stream having an outer diameter generally matching the throat diameter, the throat having a length of less than about one-half inch.

4,419,075

BLAST FURNACE STOVE WALL

Jack Hyde, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 19, 1981, Ser. No. 322,744

Int. Cl.³ C21B *9/00*

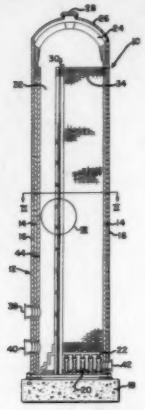
U.S. Cl. 432—217 **23 Claims**

6. A wall for internally partitioning a blast furnace stove into a combustion chamber and a checker chamber comprising:

(a) a first vertical layer of refractory material;

(b) a second vertical layer of refractory material disposed parallel to said first layer of refractory material and having at least two integral, spaced ledges, said ledges projecting inwardly toward the first layer of refractory materials; and

(c) a vertical layer of insulating material interposed between said first and second layers of refractory material so as to



abut, endwise, said inwardly projecting ledges, such that at least a part of any radially directed pressure resulting from a greater relative thermal expansion of one of said layers of refractory material will be borne by the other of said layers of refractory material.

4,419,076

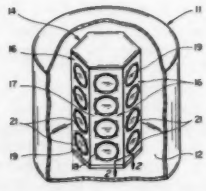
WAFER TRAY CONSTRUCTION

Samson Kirshman, San Jose, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Jan. 28, 1982, Ser. No. 343,587

Int. Cl.³ F27D *5/00*

U.S. Cl. 432—253 **13 Claims**

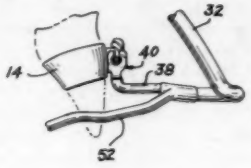


1. In apparatus for processing wafers in a plasma reactor having a chamber in which a gas plasma is formed and a support for holding trays of wafers to be processed in the chamber: an array of wafer holding trays mounted on the support with an overlap at the adjacent edges of the trays preventing line-of-sight communication between the trays and permitting individual ones of the trays to be removed from the support at random without disturbing the remaining trays in the array.

4,419,077
ORTHODONTIC FACE-BOW AND METHOD OF PREVENTING INJURIES WITH THE USE OF FACE-BOWS

Sidney Asher, 165 Keswick C at Century Blvd., Deerfield Beach, Fla. 33441

Filed Jan. 31, 1983, Ser. No. 462,665
Int. Cl.³ A61C 7/00
U.S. Cl. 433—5 **14 Claims**

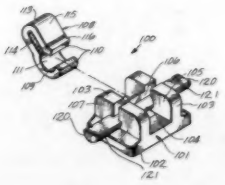


1. An orthodontic face-bow for preventing facial and eye injury and adapted to apply force to a patient's teeth through an orthodontic arch fixed to the patient's teeth and adapted to be removably connected to said arch, said face-bow comprising a frame having a pair of rearwardly extending arms each terminating in hook means at the rear end and in a central frame portion at their forward ends, spaced levers secured to said frame adjacent said central frame portion, each of said levers extending upwardly and being removably connectable to said arch by a fork portion having a generally rectangular lumen which terminates in a keyhole portion, and an auxiliary arch wire secured to said frame adjacent said central frame portion, said auxiliary arch wire comprising auxiliary arms extending rearwardly from said central frame portion, each auxiliary arm having an end portion adapted to be removably positioned in association with a buccal tube fixed to a molar for securing said face-bow against removal from a patient's mouth.

4,419,078
ORTHODONTIC BRACKET

Erwin C. Pletcher, P.O. Box 566, Rancho Santa Fe, Calif. 92067

Continuation-in-part of Ser. No. 265,377, May 20, 1981, abandoned. This application Nov. 18, 1982, Ser. No. 442,753
Int. Cl.³ A61C 7/00
U.S. Cl. 433—10 **7 Claims**

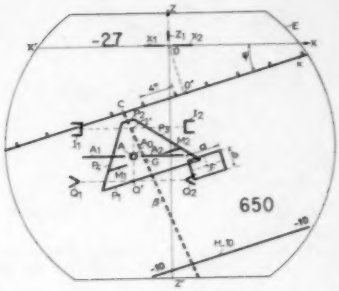


1. An orthodontic bracket assembly, comprising:
a base with a rear tooth-facing surface, a pair of mesiodistally spaced-apart support members extending forwardly with respect to the rear surface, and a bearing member extending between the support members, the bearing member defining a base slot to receive an arch wire; and
a locking member with a hub having a mesiodistal passage therethrough, the passage being configured to receive the bearing member so the hub fits captively and rotatably over the bearing member, the hub being deformable to enable installation over the bearing member, the hub further having a mesiodistal slot extending therethrough into communication with the passage;
the locking member being rotatable on the bearing member between open and closed positions, the open position aligning the slots to enable seating of an arch wire in the base slot, and the closed position placing the hub slot out of alignment with the base slot to capture the arch wire within the bracket assembly.

4,419,079
AIRCRAFT PILOTING AID SYSTEM

Jean-Francois M. Georges, Ville d'Avray, and Roger Parus, Saint-Remy-les-Chevreuse, both of France, assignors to Avions Marcel Dassault-Breguet Aviation, Vaucresson and Thomson-CSF, Paris, both of, France

Filed Jul. 20, 1981, Ser. No. 284,666
Claims priority, application France, Jul. 23, 1980, 80 16234
Int. Cl.³ G09B 9/08
U.S. Cl. 434—43 **11 Claims**



1. A piloting aid system for aiding in piloting or in simulating the piloting of an aircraft, comprising:
a display unit having a display screen and means for displaying on said display screen symbols representative of a plurality of determined flight and environmental characteristics of said aircraft;
means for determining drift angle δ and a slope relative to ground γ_S of a flight path of said aircraft;
means for displaying a symbol representing said aircraft near a point having an abscissa and an ordinate on said display screen, said abscissa and said ordinate of said point with respect to two mutually perpendicular axes on said display screen being respectively proportional to the determined values of δ and γ_S; and
means for displaying a guidance symbol for the aircraft flight path comprising a rectangular guidance window having pairs of sides respectively parallel to said mutually perpendicular axes.

4,419,080
METHOD AND APPARATUS FOR TEACHING GRAMMAR

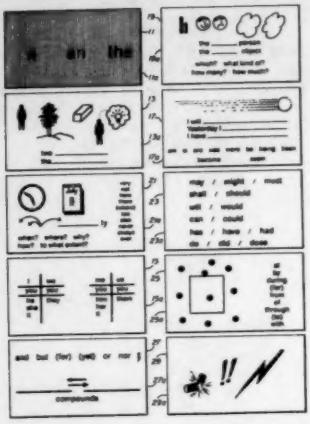
Paul R. Erwin, Dallas, Tex., assignor to Class Press, Inc., Dallas, Tex.

Filed Dec. 28, 1981, Ser. No. 335,225
Int. Cl.³ G09B 1/00
U.S. Cl. 434—172 **2 Claims**

1. A teaching method wherein a student learns to recognize and understand the function of the parts of speech in a sentence, which comprises the steps of:
providing to the student a plurality of sets of parts of speech cards, each set having a part of speech card having a first side having a representation that indicates the function of a part of speech and a second side having the name of the part of speech, the function of which is indicated on the first side, and a direction to mark the part of speech in the sentence in a particular manner;

matching to each word of the sentence a first side of the part of speech card that corresponds to the word;

reversing the matched parts of speech cards whereby the second sides of the matched parts of speech cards correspond to the words of the sentence with the name of the part



of speech corresponding to a word in the sentence that functions in that part of speech;

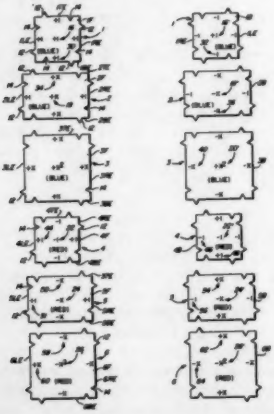
and marking the words of the sentence in the manner of the direction on the corresponding matched second side of the part of speech card.

4,419,081

MATHEMATICAL TEACHING/LEARNING AID AND METHOD OF USE

Phyllis R. Steinmann, 6928 E. Sunnyvale Rd., Scottsdale, Ariz. 85253

Filed Aug. 23, 1982, Ser. No. 410,533
Int. Cl.³ G09B *1/36, 19/02*
U.S. Cl. 434—188 **9 Claims**



1. A set of mathematical blocks useful in teaching and learning mathematics, each of said blocks having a front face, a back face, and, with reference to its front face, a top edge, a right edge, a bottom edge, and a left edge, said set comprising in combination:

a plurality of said blocks that are referred to as +1 blocks, each having on its front face four edge dimension indicia referred to as +1 dimensions adjacent to its top, right, bottom, and left edges, respectively, and having on its back face four edge dimension indicia referred to as −1 dimensions adjacent to its top, right, bottom, and left edges, respectively;

a plurality of said blocks that are referred to as +X blocks each having on its front face two edge dimension indicia referred to as +X dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as +1 dimensions adjacent to its left and right edges, and having on its back face two edge dimension indicia referred to as −X dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as −1 dimension adjacent to its right and left edges, respectively;

a plurality of said blocks that are referred to as $+X^2$ blocks each having on its front face four edge dimension indicia referred to as +X dimensions adjacent to its top, right, bottom, and left edges, respectively, and having on its back face a plurality of edge dimension indicia referred to as −X dimensions adjacent to its top, right, bottom and left edges, respectively;

a plurality of said blocks referred to as −1 blocks each having on its front face two edge dimension indicia referred to as −1 dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as +1 dimensions adjacent to its right and left edges, respectively, and having on its back face two edge dimension indicia referred to as +1 edge dimensions adjacent to its top and bottom edges, respectively, and two edge dimension indicia referred to as −1 edge dimensions adjacent to its left and right edges, respectively;

a plurality of said blocks referred to as −X blocks each having on its front face two edge dimension indicia referred to as −X edge dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as +1 dimensions adjacent to its right and left edges and having on its back face two edge dimension indicia referred to as +X edge dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as −1 edge dimensions adjacent to its right and left edges;

a plurality of said blocks referred to as $-X^2$ blocks each having on its front face two edge dimension indicia referred to as −X edge dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as +X edge dimensions adjacent to its left and right edges and having on its back face two edge dimension indicia referred to as +X edge dimensions adjacent to its top and bottom edges and two edge dimension indicia referred to as −X edge dimensions adjacent to its right and left edges;

each of said +1, +X, and $+X^2$ blocks having at each of its edges and edge alignment means for effecting proper alignment of that edge with only one edge of any of the other blocks, the lengths of each of the edges of said blocks having a +1 edge dimension or a −1 edge dimension being equal, and the lengths of each of the edges of said blocks having a +X edge dimension or a −X edge dimension being equal, the edges with +X or −X edge dimensions being different in length than the edges having +1 or −1 edge dimensions, whereby various ones of said blocks can be arranged to form rectangles representing algebraic expressions wherein the sums of the dimension indicia of each side of the formed rectangle represent factors of the algebraic expression.

4,419,082

WATER-JET DRIVE MECHANISM FOR DRIVING AND CONTROLLING OF PARTICULARLY SHALLOW-DRAUGHT WATERCRAFTS

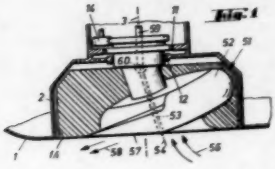
Franz Krautkremer, and Siegfried Lais, both of Spay, Rhein, Fed. Rep. of Germany, assignors to Schottel-Werft Josef Becker GmbH & Co KG, Spay, Rhein, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 271,898

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022903

Int. Cl.³ B63H *11/02*

U.S. Cl. 440—42 4 Claims



1. In a water-jet drive mechanism for propelling and controlling a watercraft on a body of water, including a pump having an inlet opening communicating with said body of water and a nozzle extending in a downwardly inclined direction, said pump being supported in a support housing which is pivotal about a substantially vertical axis, and sucking water into said inlet opening and then ejecting it through said nozzle in said downwardly inclined direction, said inlet opening and nozzle being located above the undersurface of said watercraft, said pump being a centrifugal pump having an impeller which rotates in a spiral housing, the improvement comprising wherein the axis of rotation of said impeller of said pump is inclined with respect to said pivot axis of said support housing and lies in a vertical plane arranged at an angle with respect to said direction of said nozzle, whereby the effective length and height of said nozzle are larger than if said axis of rotation of said impeller of said pump were to lie in a vertical plane parallel to said direction of said nozzle.

4,419,083

TILT LEVER RETURNING MECHANISM FOR OUTBOARD ENGINE

Michihiro Taguchi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

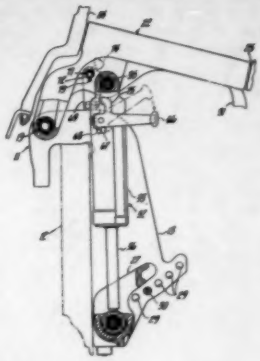
Filed Jan. 28, 1982, Ser. No. 343,467

Claims priority, application Japan, Jan. 31, 1981, 56-13480

Int. Cl.³ B63H *21/26, 5/12*

U.S. Cl. 440—56 7 Claims

1. In an outboard drive unit having a first member adapted to be affixed to the hull of a boat, a drive unit supported for pivotal, tilting movement by said first member about a generally horizontally extending axis, tilt stop means movable between a released position and an operative position for retaining said drive unit in a tilted up position, tilt lock means movable between a released position and a locked position for releasably restraining said drive unit in a tilted down position, the improvement comprising means on said tilt stop means engageable with means on said tilt lock means for moving said tilt lock means from its released position to its locked position



upon movement of said tilt stop means to its operative position when said drive unit is in its tilted position.

4,419,084

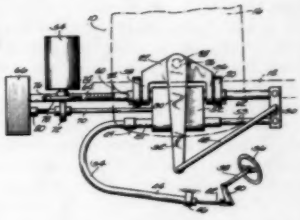
POWER ASSISTED STEERING FOR MARINE PROPULSION DEVICE

Gaylord M. Borst, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 26, 1979, Ser. No. 106,542

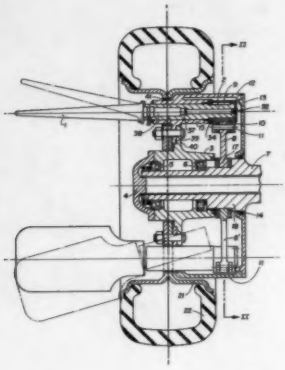
Int. Cl.³ B63H *25/02*

U.S. Cl. 440—58 14 Claims



10. An outboard motor for a boat having a hull, said outboard motor comprising a support adapted to be fixed relative to the hull, propulsion means including a rotatably mounted propeller, means connecting said propulsion means to said support for pivotal steering movement about a steering axis, an electric motor which is continuously driven during operation of said outboard motor and which includes a rotatable output shaft, a member connected to said propulsion means and movable to effect steering movement of said propulsion means, and means including a push pull cable for selectively mechanically drivingly connecting and disconnecting said output shaft to said member in such manner as to selectively displace said member in opposite directions in response to selective driving connection between said output shaft and said member so as thereby to effect power assisted steering movement of said propulsion means.

4,419,085
AMPHIBIOUS VEHICLE
Rudolf Laucks, Heidenheim, and Karl Blickle, Herbrechtingen-Bolheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany
Filed Oct. 29, 1981, Ser. No. 316,505
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1980, 3041483
Int. Cl.³ B63H *1/08*
U.S. Cl. 440—93 6 Claims



1. In an amphibious vehicle having driven wheels connected to respective driving shafts for movement along dry surfaces and driving means for movement in a fluid, wherein at least one of said driven wheels has a rim connected to a hub and is provided with a plurality of propeller blades on supporting means attached to said at least one driven wheel and means for adjusting the position of said propeller blades relative to said at least one driven wheel, said propeller blades generating propulsion upon rotation of said at least one driven wheel in accordance with the principle of cycloidal propellers and supported by said supporting means such that said propeller blades substantially protrude axially outwardly, the improvement comprising:

said propeller blades having respective control portions and respective attachment portions thereon,

a pluality of blade-receiving means, each said blade receiving means comprising a cup-shaped blade support means connected to said hub for receiving therein said control portion and the outer end of said attachment portion of a respective one of said propeller blades,

said cup-shaped blade support means being concentrically connected to one of said at least one driven wheel and said driving shaft therefor on the side of said at least one driven wheel located towards the center axis of said vehicle,

said propeller blades being receivable in respective said cup-shaped blade support means from the side of said at least one driven wheel opposite the center axis of said vehicle,

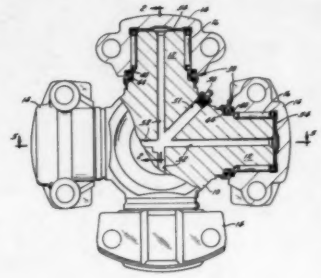
a hollow wheel axle connected to said at least one driven wheel and receiving said driving shaft therein,

an eccentric on said hollow wheel axle and being of sine kinematics having a substantially rigidly defined, unchangeable eccentricity,

a control ring rotatably mounted around said eccentric, and

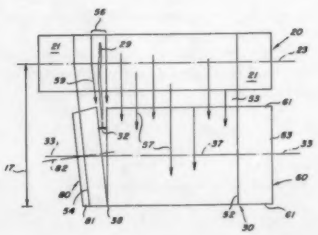
a plurality of control arms connected between and to said control ring and respective said propeller blades for the operation thereof.

4,419,086
TRUNNION SEAL AND CROSS VENTING SYSTEM FOR A CARDAN-TYPE UNIVERSAL JOINT
William T. Condon, Rockford, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.
Filed Sep. 11, 1981, Ser. No. 301,301
Int. Cl.³ F16D *3/26, 3/40*
U.S. Cl. 464—14 4 Claims



1. A sealing and venting assembly for a trunnion and bearing for a universal joint, said assembly comprising a cross having a plurality of trunnion pins extending therefrom, a cylindrical bushing rotatably mounted on and over the outer end of each of said trunnion pins, an anti-friction roller bearing assembly located between each of said trunnion pins and its associated cylindrical bushing for rotatably journalling said bushing on its trunnion pin, a mechanical, face type trunnion seal located between said trunnion pin and said cylindrical bushing, said trunnion seal comprising a pair of stamped L-shaped steel rings having adjacent ground and lapped surfaces which abut together to form a mechanical face seal having a face sealing area therebetween; said rings having a net internal area on which internal pressure acts on said rings; the ratio of said net internal area to said face sealing area being at least 0.60 to render said face seal self-sealing; said face type trunnion seal also including a pair of elastomeric o-rings bearing against said cylindrical bushing, said rings and said trunnion pin.

4,419,087
SPLAYED ROLL FOLDER FOR ADHESIVE APPLICATION
F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Aug. 28, 1981, Ser. No. 297,523
Int. Cl.³ B65H *45/22*
U.S. Cl. 493—439 28 Claims



1. An apparatus for folding a strip in a continuously advancing sheet of indeterminate length to form a pleat in said sheet comprising:

a tensioning means for subjecting a reach of said sheet to

tension along a line of departure that is transversely disposed to said sheet;

a composite roll of a predetermined diameter having a composite peripheral surface which receives said reach along a line of arrival thereon, said sheet thereafter traveling over said composite peripheral surface through a peripheral distance;

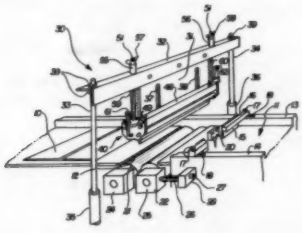
said composite roll comprising at least a first component roll which has a first peripheral surface and a first axis transverse to the direction of said sheet and at least a second component roll mounted adjacent one end of said first component roll which has a second peripheral surface and a second axis of rotation approximately coaxial but inclined toward the first axis of rotation of said first component roll at a pleat angle, the first and second peripheral surfaces of said first and second component rolls defining said composite peripheral surface of said composite roll, said first and second component rolls having circular sides on respective axial ends of the rolls which oppose one another throughout their extents and which converge due to the inclined axis of rotation of said second component roll relative to the axis of said first component roll to form a circularly converging gap extending about at least a portion of the composite peripheral surface of said composite roll, said gap converging to a pinch zone along which said opposing sides are in revolving contact, the opposing circular sides of said first and second component rolls serving to fold said strip to form a pleat in said sheet as said sheet passes over said composite roll.

4,419,088

GATE FOLDING APPARATUS

David G. Nemec, 13621 Silver Rd., Garfield Hts., Ohio 44125

Filed Jun. 19, 1981, Ser. No. 275,285
Int. Cl.³ B65H *45/18*
U.S. Cl. 493—444 **6 Claims**



1. In apparatus for making a gate fold in a sheet having two inwardly extending prefolded flaps forming two folded end edges, said apparatus including a folding table defining a central opening, means for transporting said sheet across said table, means for stopping said sheet at a predetermined position on said table with a central portion of said sheet spanning said opening, and a pair of fold rolls below said opening adapted to pass said sheet therebetween to form said gate fold, the improvement which comprises:

a gate assembly located above said opening and movable between a retracted position and a downwardly extended position, said assembly including

a blade adapted to drive a portion of said sheet between said rollers when said assembly is in its extended position, said blade having a lower end, and

a tuck roll assembly including

a pair of tuck rolls extending parallel to said fold rolls, one tuck roll being located on each side of said blade and a pair of bearing blocks spaced at opposite ends of said assembly, said tuck rolls being journaled at each end in a respective bearing block,

means for supporting and guiding the rolls of said tuck roll assembly for vertical movement relative to said blade between a normal position adjacent and above the lower end of said blade and a retracted position spaced above the normal position, and

means urging said tuck roll assembly toward said normal position, each of said tuck rolls being adapted to cooperate with a respective fold roll to movably guide a portion of said sheet passing therebetween,

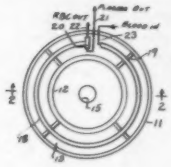
whereby when said prefolded sheet reaches a predetermined position on said table said gate assembly is lowered and the lower end of said blade engages a central zone across said sheet and drives it downwardly, said tuck rolls engaging said sheet adjacent each respective fold roll to grip respective portions of said sheet to control said sheet as the lower end of said blade drives said central zone between said fold rolls to form a gate fold in said sheet.

4,419,089

BLOOD CELL SEPARATOR

Theodor Kolobow, Rockville, and Yoichiro Ito, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jul. 19, 1977, Ser. No. 817,016
Int. Cl.³ B04B *7/12*
U.S. Cl. 494—45 **9 Claims**



1. A flow-through centrifuge apparatus comprising a bowl member mounted on a vertical axis; means for rotating said bowl member about said axis; a tubular rotor chamber annularly disposed substantially concentrically in said bowl member, said tubular chamber having a first end, a second end and a radial extent; first outlet conduit means communicatively coupled to said tubular rotor chamber at a first given radial distance from said axis for removing a heavy fraction during flow-through procedure; second outlet conduit means communicatively coupled to said tubular rotor chamber at a second given radial distance from said axis closer to said axis than said first radial distance for removing a light fraction during flow-through procedure; and inlet conduit means communicatively connected to said tubular rotor chamber for admitting material to be separated into said tubular chamber, at a third given radial distance from said axis intermediate said first radial distance and said second radial distance; whereby during flow-through procedure, the heavier phase of the material supplied via the inlet conduit means travels along the tubular rotor chamber, toward said first end and the lighter phase of the material travels along the tubular rotor chamber toward said second end, the heavier and lighter phases forming an interface within the tubular rotor chamber.

4,419,090

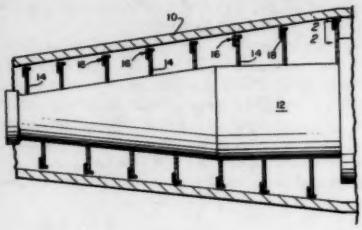
FIELD REPLACEABLE SCREW CONVEYOR INSERTS

Edmund C. Chulada, Londonderry, and David A. Nelson, Wilton, both of N.H., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 31, 1981, Ser. No. 289,042
Int. Cl.³ B04B *3/04*
U.S. Cl. 494—53 **2 Claims**

1. An apparatus for separating a solid-liquid mixture comprising: a housing; a metal screw conveyor adapted to rotate

relative to the housing on a common longitudinal axis; said conveyor having helically-formed flights abouts its axis; and a plurality of replaceable inserts secured on the entire circumference of the flanks of said flights, all of said inserts of a pitch



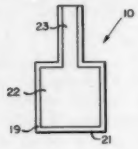
length having been formed from the same annular member, said annular member being substantially equal to the curvature of the periphery of the screw conveyor, each insert having metal secured to said flights and an integral wear-resistant material adapted to function as the working surface.

4,419,091

METALIZED MEDICAL TREATMENT ELECTRODE WITH INSULATED EDGE

Robert S. Behl, Fairport, and Franklin H. Ellis, Rochester, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Feb. 12, 1981, Ser. No. 233,899
Int. Cl.³ A61N *1/30*
U.S. Cl. 604—20 **2 Claims**



1. A flexible porous electrode for ion therapy comprising a substrate of polymer fibers, each of such fibers coated with a thin layer of conductive material to form a conductive mass, said substrate characterized by:

a peripheral border in which said fibers are fused into a liquid-impervious and non-conductive mat, whereby conductive solution and conductive fibers are generally contained within said border, and ion concentration and current flow are thereby confined to the area within the periphery defined by said border, and

said substrate including a tab portion through which said conductive fibers are adapted for electrical connection to a conductor.

4,419,092

IONTOPHORETIC ELECTRODE STRUCTURE

Stephen C. Jacobsen, Salt Lake City; Richard D. Luntz, Murray, and Barry K. Hanover, Salt Lake City, all of Utah, assignors to Motion Control, Inc., Salt Lake City, Utah

Filed Nov. 6, 1981, Ser. No. 319,074
Int. Cl.³ A61N *1/30*
U.S. Cl. 604—20 **12 Claims**

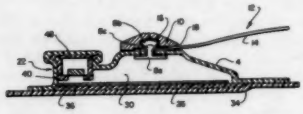
1. A bioelectrode for use in the iontophoretic delivery of ions into the skin or tissue of a person comprising

an enclosure having a bottom wall formed of a membrane through which ions may migrate when subjected to an electric field and an upper wall joined to the bottom wall to define an interior compartment for holding an ion-containing solution,

an electrode mounted to the enclosure to communicate electrically with the interior compartment of the enclosure through the upper wall, and

receptacle means disposed in the enclosure for receiving solution into the enclosure, said receptacle means having a top and a bottom and being attached to said upper wall so that the bottom of the receptacle means is elevated above and out of contact with the bottom wall, said receptacle means including

a conduit open at a first end, defining said top, which is directed away from the bottom wall,



one or more openings located in the conduit to allow solution which is introduced into the conduit to flow therefrom,

a blocking element disposed at a second end defining said bottom of the conduit to prevent a needle inserted into the conduit through the first end from passing through the second end, and

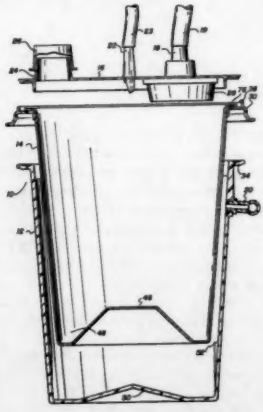
a plug means disposed in the first end to prevent solution from escaping from the interior of the enclosure, said plug means being made of a resilient material through which a needle may be inserted and which, when the needle is retracted, closes about the opening made by the needle.

4,419,093

METHOD OF RECEIVING AND DISPOSING OF FLUIDS FROM THE BODY

David W. Deaton, Abilene, Tex., assignor to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 113,620, Jan. 21, 1980, Pat. No. 4,321,922.
This application Sep. 14, 1981, Ser. No. 301,525
Int. Cl.³ A61M *31/00, 1/00*
U.S. Cl. 604—49 **9 Claims**



1. A method of receiving fluids and disposing fluids from the body of a patient comprising:

placing a disposable semi-rigid, burst resistive container having an open mouth inside a rigid outer canister;

supporting said container from said canister such that a

space is formed between the wall surfaces of said container and said canister;

fixedly attaching a cover over said open mouth of said canister to form an integral unit;

retaining said cover in place by coacting with said container;

applying vacuum to the interior of said container;

drawing fluid from the patient into said container; and

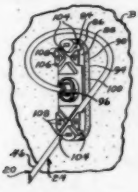
removing said semi-rigid container and said cover as an integral unit to maintain a seal and avoid contamination when all fluid is received for disposal thereof.

4,419,094

SUPRAPUBIC CATHETER SYSTEM

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jun. 8, 1981, Ser. No. 271,292
Int. Cl.³ A61M *11/00*
U.S. Cl. 604—93 **6 Claims**



1. A suprapubic catheter system, comprising:

a puncture member comprising an elongated needle; and

a catheter assembly comprising an elongated catheter having a distal end for placement in a patient, a proximal end, and a lumen to receive the needle, a stabilizer comprising a plate extending on opposed sides of the catheter, with said plate having an opening to slidably receive the plate on the catheter, and means for selectively locking the stabilizer at a desired position on the catheter, said locking means comprising, an elastic plug having a bore to slidably receive the catheter, a body member having a cavity to receive the plug and a bore to slidably receive the catheter, with a distal end of the body member being secured to a proximal side of the stabilizer plate, a compression member having a bore to slidably receive the catheter and a nipple for contacting the plug, and means for adjustably securing the compression member to a proximal end of the body member, such that the compression member may be moved from a first proximal position with the bore of the plug sufficiently large for sliding the plug along the catheter, and a second distal position with the nipple bearing upon the plug to decrease the size of the plug bore in order for the plug to frictionally engage the outer surface of the catheter.

4,419,095

CANNULA WITH RADIOPAQUE TIP

Perry A. Nebergall, Laguna Hills, and Robert C. French, El Toro, both of Calif., assignors to Shiley, Inc., Irvine, Calif.

Filed May 14, 1980, Ser. No. 149,568
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—96 **4 Claims**

1. A cannula for insertion into a body cavity, duct, vessel, and the like, of a patient, said cannula being formed by joining at least two distinct elements, comprising:

a parent cannula member having distal and proximal ends;

a radiopaque tip fused to said distal end of said cannula member to form a unitary cannula with said cannula member for substantially preventing detachment of said radiopaque tip within said cavity, duct, vessel, and the like, of said patient, said radiopaque tip having a reduced diameter in one location in order to form an annular shoulder on said tip, said radiopaque tip having a durometer Shore hardness factor of approximately 10 less than said parent cannula member; and

an inflatable cuff mounted on and surrounding said parent cannula member, said cuff being attached to said cannula member by means of sleeves, at least one of said sleeves abutting said annular shoulder on said radiopaque tip in order to provide a smooth exterior surface on said cannula to prevent injury to said patient.

4,419,096

ELASTOMERIC BLADDER ASSEMBLY

Harold M. Leeper, Mountain View; Nikki Baumrind, and John R. Peery, both of Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Feb. 22, 1982, Ser. No. 350,585
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—132 **9 Claims**

1. A positive expulsion bladder assembly comprising, in combination, an elastomeric bladder having a central lumen with a predetermined, unexpanded, internal diameter and lumen filling core means within said bladder, said core means being provided with a bulbar portion having a diameter greater than said predetermined internal diameter.

4,419,097

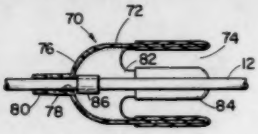
ATTACHMENT FOR CATHETER TUBE

Floyd C. Rowland, Tulsa, Okla., assignor to Rexar Industries, Inc., Tulsa, Okla.

Filed Jul. 31, 1981, Ser. No. 288,993
Int. Cl.³ A61M *25/02*
U.S. Cl. 604—174 **10 Claims**

2. An independent attachment for a catheter tube and comprising relatively rigid housing means having one open end and one closed end, said closed end being provided with aperture

means for receiving the catheter tube therethrough, said housing means being movable longitudinally along the outer periphery of the catheter tube for receiving a male member through the open end thereof, means for securing the housing means directly to the male member for extended time periods



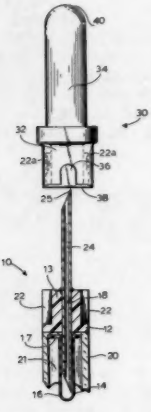
for isolating movement of the catheter tube from the male member for comfort of the male member, and including sleeve means disposed within the housing means in the proximity of the aperture means for receiving the catheter tube therethrough for movement therewith for precluding accidental withdrawal of the catheter tube from the housing means.

4,419,098

NEEDLE SHIELD

Michael C. Bennett, Summit, N.J., assignor to Becton Dickinson and Company, Paramus, N.J.

Filed Nov. 12, 1981, Ser. No. 320,361
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—263 **4 Claims**



1. A needle shield for a needle holding assembly, characterized by

(a) a longitudinally extending housing defining an elongated chamber therein;

(b) said housing having a closed end and an open end;

(c) at least one radial slot in said housing extending from said open end to a point spaced from said open end; and

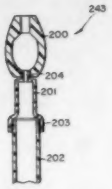
(d) said radial slot providing communication between said elongated chamber and outside said shield throughout the length of said slot.

4,419,099

ENEMA APPARATA IMPROVEMENTS RELATING TO DOUBLE CONTRAST STUDIES

Roscoe E. Miller, 7400 W. 88th St., Indianapolis, Ind. 46278

Continuation-in-part of Ser. No. 131,965, Apr. 4, 1980, Pat. No. 4,333,460, which is a continuation-in-part of Ser. No. 39,502, May 16, 1979, abandoned. This application Feb. 11, 1982, Ser. No. 347,900
Int. Cl.³ A61M *3/00*
U.S. Cl. 604—275 **8 Claims**



1. An enema administering apparatus for use with a contrast medium tube of a first size, said apparatus being insertable into the rectum for delivery of a contrast medium to internal portions of a patient's anatomy and comprising:

an enlarged, hollow, enema tip including a contrast medium passageway extending therethrough and a first contrast medium opening disposed in flow communication with said contrast medium passageway, said first contrast medium opening having a second size substantially different size from said first size of said tube; and

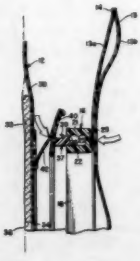
interchangeable connecting adapter means having a first end designed and arranged to be manually and securely assembled to and manually disassembled from said first contrast medium opening and a second, opposite end designed and arranged to be manually and securely assembled to and manually disassembled from said contrast medium tube, said first end having a third size corresponding to said second size of said contrast medium opening of said tip and said second opposite end having a fourth size corresponding to said first size of said tube, said third size being substantially different in size from said fourth size, said interchangeable connecting adapter means including an adapter contrast medium passageway which is arranged in flow communication between said first end and said second opposite end.

4,419,100

OSTOMY APPLIANCE AND FACEPLATE ATTACHMENT THEREFOR

Brian S. Alexander, Evanston, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Mar. 16, 1982, Ser. No. 358,689
Int. Cl.³ A61F *5/44*
U.S. Cl. 604—339 **17 Claims**



1. An ostomy appliance comprising a flexible collection

pouch and a flexible, apertured faceplate adapted to be adhesively secured to a peristomal surface, and a pair of first and second semi-rigid coupling rings detachably connectable to each other, said first coupling ring being secured to said pouch and communicating with the interior thereof, and said second coupling ring being mounted upon said faceplate adjacent the aperture thereof, wherein the improvement comprises

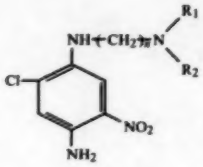
said second ring being mounted upon said faceplate by flexible annular plastic web means having a pair of concentric edge portions, one of said edge portions being connected to said second ring and the other of said edge portions being connected to said faceplate about the aperture thereof, said flexible web means allowing limited movement of said second ring in generally axial directions normal to said faceplate to permit insertion of the fingers between said second ring and said faceplate and thereby facilitate attachment and detachment of said rings without causing wearer discomfort and to allow conformity of said flexible faceplate to a wearer's body without objectionable resistance from said semi-rigid rings.

4,419,101
CHLORINE-SUBSTITUTED NITRO-PARA-PHENYLENEDIAMINES, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN DYEING KERATIN FIBRES

Andree Bugaut, Boulogne-Billancourt, and Jean Cotteret, Franconville, both of France, assignors to L'Oreal, Paris, France

Filed May 24, 1982, Ser. No. 381,636
Claims priority, application France, May 25, 1981, 81 10374
Int. Cl.³ A61K *7/13; C07C 87/60*
U.S. Cl. 8—415 **20 Claims**

1. A nitro-para-phenylenediamine derivative which corresponds to the formula (I):



(I)

in which R_1 and R_2, which are identical or different, denote hydrogen, a lower alkyl group or a monohydroxylated or polyhydroxylated alkyl group and n is an integer from 2 to 4 inclusive, or a cosmetically acceptable salt thereof.

6. A composition suitable for dyeing keratin fibres which comprises a diluent or carrier and at least one derivative as defined in claim 1 in an amount effective for dyeing hair.

16. Process for dyeing keratin fibres, which comprises applying thereto a composition as defined in claim 6, in an amount effective to dye hair, leaving it on the fibres for 5 to 70 minutes and then rinsing, optionally washing and rinsing again, the fibres and then drying them.

4,419,102
PROCESS FOR LEVEL DYEING OF TEXTILES BY HEAT TRANSFER

Emery J. Gorondy, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Nov. 30, 1979, Ser. No. 98,977
Int. Cl.³ D06P *5/00*
U.S. Cl. 8—471 **30 Claims**

1. A process comprising dyeing polymeric film at a temperature between about 120° C. and less than the softening point of the film with a disperse dye dissolved in an organic solvent for the dye having a boiling point above the dyeing temperature, and thereafter contacting said dyed film with a polymeric textile material in the presence of sufficient heat to cause said dye to sublime or vaporize and transfer some of said dye from said film to said textile material, whereby level dyeing of said textile material is effected; both said film and textile material having affinity for said dye, softening points which are higher, and glass transition temperatures which are lower, than the temperature needed to effect sublimation or vaporization and transfer of said dye from said film to said textile material.

4,419,103
METHOD AND APPARATUS FOR COLORING EASTER EGGS

Thelma E. Balkan, 17 Jefferson St., Pinehurst, Mass. 01866

Filed Sep. 7, 1978, Ser. No. 940,392
Int. Cl.³ B05C *11/08;* **D06P** *5/20*
U.S. Cl. 8—506 **3 Claims**

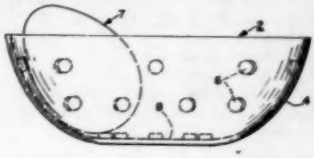
1. Apparatus for coloring Easter eggs with a liquid dye comprising

a generally dish-shaped container having

a bottom and an outwardly sloping side wall, the inner exposed surface being formed predominately of material non-absorbent to liquid dye and having on said bottom and on said side wall a plurality of inwardly-extending projections each having an exposed substantially planar tip surface of resilient material capable of absorbing liquid, the inner ends of said projections being separated by a substantial distance from the inner ends of adjacent projections.

3. The method of coloring Easter eggs comprising the steps of

providing a container having a bottom and an outwardly sloping side wall, the inner surfaces thereof being predominately non-absorbent to liquid dye, said bottom and said side wall each having a plurality of spaced inwardly-extending projections thereon, the diameter of said dish being substantially greater than the diameter of the Easter egg to be colored,



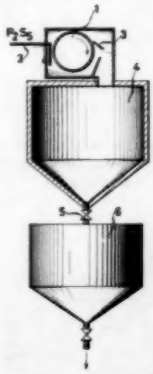
exposing an Easter egg to liquid dye, and

redistributing increments of said dye by swirling said egg, while wet with the liquid dye, around the inside of said container in successive momentary contact with said projections on said side wall and on said bottom.

4,419,104
PREPARING P_2S_5 OF LOW REACTIVITY

Hermann Niermann, Erftstadt; Günter Reichert, Bornheim-Merten; Hans Ebert, Erftstadt, and Friedrich Neumann, Holzwickede, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 71,307, Aug. 30, 1979, abandoned. This application Jul. 2, 1981, Ser. No. 279,817
Int. Cl.³ C01B *25/14*
U.S. Cl. 23—293 R **2 Claims**



1. In the process of preparing solid phosphorus pentasulfide of low reactivity from liquid phosphorus pentasulfide, the improvement comprising solidifying the liquid on a cooling cylinder to abruptly cool it to a temperature of 150°–220° C., immediately scraping the solidified material from the cooling cylinder and depositing the scrapings in a container having thermally insulated walls, without the application of external heat permitting the deposited scrapings to dissipate their heat content through those insulated walls at a rate that lowers their

temperature not more than 30° C. per hour for between one and four hours to control the reactivity of the final product, and then more rapidly further cooling the thus-cooled scrapings to below 65° C.

4,419,105

MALEIC ANHYDRIDE-AMINE REACTION PRODUCT CORROSION INHIBITOR FOR ALCOHOLS

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,454
Int. Cl.³ C10L *1/02, 1/18, 1/22*
U.S. Cl. 44—53 **42 Claims**

1. A composition comprising
(i) a water-soluble alcohol; and
(ii) an effective corrosion-inhibiting amount of the reaction product of a maleic acid anhydride and an amine having the formula

$$R(OR')_x[NH\ R'')_a(OR''')_{y(a-1)}]NH_2$$

wherein
R is a C_1–C_{20} alkyl, alkaryl, aralkyl, aryl, cycloalkyl, or alkenyl hydrocarbon group;
R', R'' and R''' are each a C_2–C_5 alkylene hydrocarbon group;
a is an integer 0–1
x is 1–20; and y is 1–20.

4,419,106

HYDROCARBON OILS WITH IMPROVED POUR POINTS

Richard F. Miller, Humble, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 22, 1982, Ser. No. 350,921
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—62 **10 Claims**

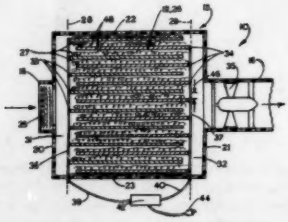
1. An oil composition comprising a hydrocarbon oil and a pour depressing amount of a copolymer of about 10 to 90 parts by weight of alkyl acrylate units containing about 8 to 30 alkyl carbon atoms and about 90 to 10 parts by weight of alpha-monoolefin units having about 12 to 40 carbon atoms per 100 parts by weight of copolymer, said copolymer having a weight average molecular weight of about 1,000 to 100,000.

4,419,107

MERCURY FILTERING APPARATUS AND METHOD

Richard H. Roydhouse, 4697 W. 3rd Ave., Vancouver, B.C., Canada V6R 1N5

Continuation-in-part of Ser. No. 205,467, Nov. 10, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 343,797
Int. Cl.³ B03C *3/00*
U.S. Cl. 55—5 **19 Claims**



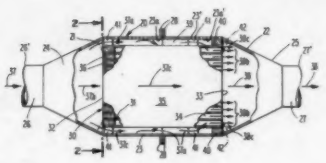
1. A method of collecting mercury from gas containing mercury, the method being characterized by:
(a) exposing the gas to an absorber means having a collecting surface of a material that readily amalgamates with mercury and is selected from a group including copper, silver, gold, platinum and zinc, the surface having a reactive tarnish produced by exposure of the collecting surface to available iodine.

4,419,108

FILTER APPARATUS AND METHOD OF FILTERING

Rodney I. Frost, Corning, and Max R. Montierth, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1982, Ser. No. 351,126
Int. Cl.³ B01D *39/20*
U.S. Cl. 55—97 **13 Claims**



1. An apparatus for filtering solid particulates from a fluid comprising:
a filter of honeycomb structure comprising:
a matrix of interconnected thin porous walls defining an inlet end face and an outlet end face and a multiplicity of cells extending longitudinally between the two end faces, and
a porous outer wall extending between the two end faces and around the matrix of thin walls and having an exterior surface forming an outer longitudinal surface of the filter,
an inlet group of the cells each being open at the inlet end face and closed at the outlet end face,
an outlet group of the cells each being closed at the inlet end face and open at the outlet end face, and
the thin walls and the outer wall each containing interconnected open porosity of volume and size sufficient to enable the fluid to flow completely across the narrow dimensions of the walls and the outer wall and to restrain at least a significant portion of the particulates from flowing completely across the thin walls or the outer wall;
conduit means having an inner surface encircling the outer wall of the filter for transporting fluid containing the particulates to the filter and filtered away from the filter, the inner surface being spaced from the outer wall to form an annual gap therebetween;
sealing means in the gap between the conduit means inner surface and the filter outer wall encircling the filter at a position remote from said outlet end face and forming a particulate barrier for preventing the particulates from bypassing the filter through the gap between the conduit means inner surface and the filter outer wall, the barrier being sufficiently narrow at the filter to allow the fluid to pass outwardly through and along a substantial portion of the exterior surface of the outer wall to the perimeter of outlet end face.

4,419,109

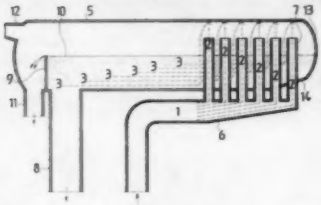
MEANS FOR DEGASSING PAPER PULP STOCK

Jouni Matula, Savonlinna, Finland, assignor to Enso-Gutzeit OY, Helsinki, Finland

Filed May 25, 1982, Ser. No. 381,786
Claims priority, application Finland, Jun. 5, 1981, 811751
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—192 **5 Claims**

1. Improvement in a means for degassing paper pulp stock, comprising an elongated horizontal cylindrical tank having a first end and a second end, a distribution pipe parallel to the

tank, a plurality of consecutive jet tubes for feeding pulp stock extend from said distribution pipe into the tank closer to the first end of the tank, an exit tube located close to the second end of the tank towards which the pulp stock flows on the bottom of the tank, means for maintaining the pulp stock level constant in the tank, an additional exit tube to return the excess pulp that has entered the tank back into circulation, and means for producing sub-atmospheric pressure in the tank, wherein



the improvement comprises that the flow in said tank is in the direction from the first end toward the second end and the flow in the distribution pipe is directed opposite to the flow within the tank, said jet tubes are spaced apart in the first end-second end direction, the flow cross section areas of said tank diminishes towards the first end in the tank where the jet tubes are located, the diminishing flow cross section extending at least over the region of one said jet tube, and being formed in that the tank is at least partially conically shaped.

4,419,110

GAS FILTER CONTAINER

William K. Ansite, Glendale; J. A. Van Haastert, Temple City, and James D. Cleary, Monrovia, all of Calif., assignors to Figgie International Inc., Willoughby, Ohio

Filed Aug. 20, 1981, Ser. No. 294,486

Int. Cl.³ B01D *46/00, 27/08*

U.S. Cl. 55—356 **9 Claims**

1. A gas filter container having assembled therein a gas filter canister of the type having a canister gas inlet and a canister gas outlet, the container and canister being capable of filtering toxic gases from an incoming gas mixture to render it breatheable upon exiting therefrom; said container comprising:

(a) a housing having a generally cylindrical sidewall-defining portion and a first end wall portion, said first end wall portion formed from an elastic, substantially gas impermeable material; said housing being provided with container inlet means capable of permitting the gas to be filtered to enter said container;

(b) a second end wall portion having an annular wall extending therefrom and engaging said sidewall-defining portion when said second end wall portion is secured to said housing to define therewith a substantially gas tight cylindrical enclosure, said second end wall portion being provided with container outlet means capable of permitting gas to exit from said container and securing means for releasably securing the gas filter canister in substantially gas-tight relationship to said second end wall portion, said second end wall portion providing communication between the canister gas outlet of said gas filter canister and said container outlet means; and

(c) means for releasably securing said second end wall portion to said housing in substantially gas-tight relationship therewith in such a manner that said generally cylindrical sidewall-defining portion, said first end wall portion, and said second end wall portion define said substantially gas-tight enclosure for said gas filter canister and provide a continuous gas flow path from the container inlet means to the container outlet means wherein all gas passing through said container also passes through the gas filter canister.

4,419,111

DEVICE FOR ABSORBING MOISTURE IN A CLOSED SPACE

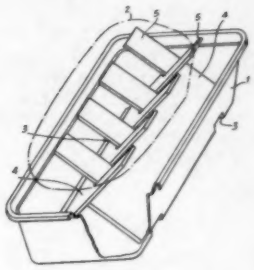
Jean A. Dumas, Rueil Malmaison, and Hildebert Naudin, Saint-Cloud, both of France, assignors to Societe Anonyme Rubson S.A.F., Rueil-Malmaison, France

Filed Aug. 11, 1981, Ser. No. 292,135

Claims priority, application France, Sep. 30, 1980, 8020910

Int. Cl.³ B01D *39/00*

U.S. Cl. 55—388 **3 Claims**



1. A device for removing moisture in a closed space comprising:

a perforated sachet of oblong shape containing hydrophilic sorbent in solid form which liquefies upon absorption of moisture;

an upwardly open tank adapted to receive the liquefied hydrophilic sorbent

and a support for said perforated sachet supporting said sachet above said tank, said support being in the form of an easel disposed in said tank and having upwardly and outwardly opposed extending teeth, said teeth supporting the perforated oblong sachet between said teeth at a level above the upper edge of the tank.

4,419,112

AIR CLEANER

Yoshio Kawamura, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Aug. 20, 1982, Ser. No. 409,891

Claims priority, application Japan, Aug. 26, 1981, 56-126893[U]

Int. Cl.³ B01D *46/00*

U.S. Cl. 55—480 **1 Claim**

1. An air cleaner comprising:

an air cleaner body having an inlet and an outlet;

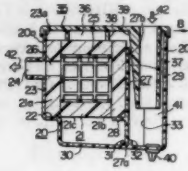
a fixed wall formed by said air cleaner body and having said outlet formed therein;

a holder plate mounted in said air cleaner body;

an air cleaner element removably held between said fixed wall and said holder plate between said inlet and said outlet;

an element inserting opening formed in said air cleaner body; and

a lid for covering said element inserting opening to close same; wherein the improvement resides in that:



said holder plate is removably mounted in said air cleaner body in a manner to be tiltable from a position in which it cooperates with the fixed wall to hold the air cleaner element therebetween to a position in which it releases the air cleaner element from holding engagement therewith, and that

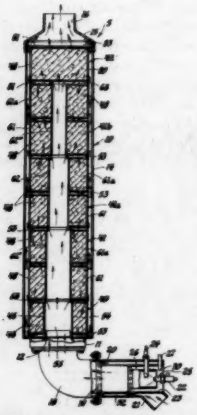
said lid for said element inserting opening is formed with a pressing portion disposed to press said holder plate against said air cleaner element to hold the air cleaner element between it and the fixed wall when said element inserting opening is closed by said lid.

4,419,113

DIESEL EXHAUST PARTICULATE TRAP WITH AXIALLY STACKED FILTERS

Richard H. Smith, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 8, 1982, Ser. No. 396,357
Int. Cl.³ B01D 46/02
U.S. Cl. 55—484 **3 Claims**



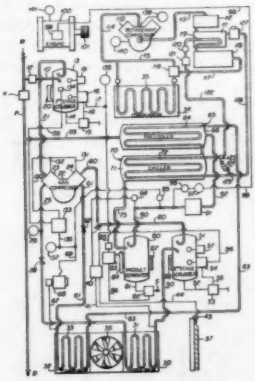
1. A particulate trap for use in removing particulates from the exhaust gas discharged from a diesel engine, said trap including an elongated tubular housing having an exhaust inlet at one end connectable to an engine and an exhaust outlet at its other end, a plurality of axial flow filter means supported in said housing to define therewith a central axial extending inlet passage in flow communication at one end with said exhaust inlet and closed by one of said filter means at the opposite end adjacent to said outlet, said filter means being stacked and positioned in said housing whereby the outer peripheral surfaces of said filter means defines with said housing an annular outlet passage in flow communication at one end with said exhaust outlet and whereby to define an alternating series of first radial passages in flow communication with said inlet passage and second radial passages in flow communcation with said outlet passage between adjacent pairs of said filter means so that exhaust gas entering said housing via said exhaust inlet will flow into said inlet passage and then via one of said first radial passages into and axially through an associate said filter means, whereby particulates are removed, the exhaust gas then flowing via an associate said second radial passage to the said outlet passage for discharge out through the exhaust outlet.

4,419,114

SYSTEM AND METHOD FOR CONVERTING WELLHEAD GAS TO LIQUEFIED PETROLEUM GASES (LPG)

Ronald L. May, Humble, and Nicholas J. Snow, Jr., Houston, both of Tex., assignors to Sappsucker, Inc., Houston, Tex.

Filed Apr. 19, 1982, Ser. No. 369,159
Int. Cl.³ F25J 3/00, 5/00
U.S. Cl. 62—17 **20 Claims**



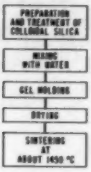
1. A system for converting natural wellhead gas to liquefied petroleum gases (LPG) containing propane and petroleum gases of lesser vapor pressure comprising components sized and designed to process wells producing less than 1000 MCFD, including: two-stage gas compressor connected to said wellhead for compressing natural gases received therefrom; refrigeration means downstream of said gas compressor for cooling the compressed gases therefrom; product separator means downstream of said refrigeration means for receiving cooled and compressed gases discharged from said refrigeration means and separating LPG therein from gases remaining in vapor form; and means to enable said compressor to essentially cycle or idle without any gases therein, responsive to means for predetermining pressures on the suction side of said compressor.

4,419,115

FABRICATION OF SINTERED HIGH-SILICA GLASSES

David W. Johnson, Jr., Pluckemin; John B. MacChesney, Lebanon, and Eliezer M. Rabinovich, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 31, 1981, Ser. No. 288,788
Int. Cl.³ C03B *37/01, 19/06*
U.S. Cl. 65—3.12 21 Claims



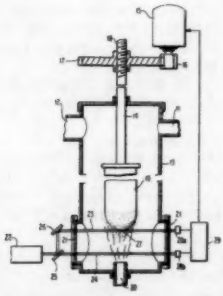
1. A method of fabricating a high-silica glass comprising;
(a) forming a substantially alkali-free first sol of particles in a liquid, the particles comprising silica;
(b) gelling the first sol to form a first gel;
(c) drying substantially the first gel, to form a dried first gel;
(d) forming particles from the dried first gel;
(e) forming a substantially alkali-free second sol of particles in a liquid, by dispersing the previously prepared, substantially alkali-free particles provided in step (d) in a liquid;
(f) gelling the second sol to form a second gel;
(g) drying substantially the second gel; and
(h) sintering the dried second gel to a glass at a temperature below the liquidus for the glass.

4,419,116

PROCESS FOR PRODUCING OPTICAL FIBER PREFORM AND APPARATUS THEREFOR

Motohiro Nakahara, Mito; Naoki Yoshioka, Kanagawa; Hiroshi Yokota, Kanagawa; Tetsuo Miyajiri, Kanagawa, and Minoru Watanabe, Kanagawa, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Sumitomo Electric Industries Limited, both of Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,958
Claims priority, application Japan, Dec. 12, 1980, 55-174726
Int. Cl.³ C03B *19/00*
U.S. Cl. 65—3.12 3 Claims



1. A process for producing an optical fiber preform by oxidizing a gaseous glass forming material with a flame from a burner and depositing the resulting soot in a rod form, wherein two signal beams, supplied by splitting a light beam, are projected in a direction normal to the direction in which the preform grows and are directed into the space between the burner and the deposition face of the preform, the two beams being positioned so that one beam partially contacts the deposition face of the preform, while the other beam is directed to pass between the burner and the deposition face, the distance between the burner and the deposition face being controlled such that the ratio of the intensity of the two beams passing through the space between the burner and the deposition face is held constant.

4,419,117

APPARATUS FOR PRODUCTION OF MINERAL WOOL FIBERS

Edgar Muschelknautz, Leverkusen, and Norbert Rink, Dormagen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 251,808, Apr. 7, 1981, Pat. No. 4,337,074.
This application Mar. 15, 1982, Ser. No. 358,403
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016114
Int. Cl.³ C03B *37/06*
U.S. Cl. 65—16 4 Claims

1. In an apparatus for the production of mineral wool fibers according to the jet blast process, the apparatus including at least one opening in the base of a melting crucible for discharging at least one melt stream into a converging-diverging drawing nozzle, means for flowing a gaseous blasting medium into the nozzle substantially parallel to the melt stream so as to separate the melt stream into fibers, the blasting medium being drawn into the nozzle by suction due to a pressure drop produced between the nozzle inlet and outlet, and a diffuser connected downstream of the nozzle to reduce the gas flow rate, the improvement which comprises employing a drawing nozzle having
(a) a contour in its converging part extending within two concentric radii of about $r_1=28\%$ and $r_2=50\%$ of the narrowest cross-section of the nozzle;
(b) a diverging portion with an expansion angle of about 1.8° to 2.2°, and
(c) a region with a constant cross-section provided below the diverging portion, and
(d) a subsonic diffuser following the region of constant cross-section.

4,419,118

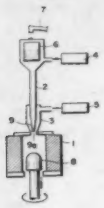
QUARTZ GLASS AND A PROCESS FOR MAKING SAME

Oguma Reiji, Hatano, and Hirai Akihiro, Odawara, both of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 331,901
Claims priority, application Japan, Dec. 23, 1980, 55-181294
Int. Cl.³ C03C *3/24*
U.S. Cl. 65—18.2 19 Claims

1. A process for producing an infrared ray-absorbing and visible light-transmitting quartz glass comprising the steps of:

forming an admixture consisting essentially of silicon oxide or a precursor thereof, iron oxide or a precursor thereof and aluminum oxide or a precursor thereof in relative amounts providing a total iron content of 0.01 to 5% by



weight and a total aluminum content of 0.01 to 10% by weight in the final product; and

melting said admixture in an oxygen-containing atmosphere in a furnace to produce said quartz glass having infrared ray-absorbing and visible light-transmitting properties.

4,419,119

METHOD OF FORMING MULTIFOCAL LENS BLANK

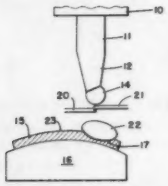
William W. Poundstone, 1503 Alderman Dr., Greensboro, N.C. 27408

Continuation of Ser. No. 900,259, Apr. 26, 1978, abandoned. This application Apr. 26, 1982, Ser. No. 371,794

The portion of the term of this patent subsequent to Dec. 6, 1997, has been disclaimed.

Int. Cl.³ C03B *11/08, 23/22, 7/00*

U.S. Cl. 65—39 **4 Claims**



1. A continuous method of forming multifocal lens blanks by flowing and fusing a minor element of molten glass into a pressed and unpolished countersink in the convex surface of a major lens blank to form a fused multifocal lens blank, comprising the steps of pressing a countersink of a preselected geometrical configuration into a major lens blank having the requisite refractive index while said major lens blank is maintained at an elevated temperature, and depositing a molten glass of the desired refractive index in the unpolished pressed countersink of said major lens blank while maintaining said major lens blank at an elevated temperature without reheating said blank to at least fill said countersink whereby the molten glass deposited in the unpolished pressed countersink of the major lens blank will be integrally fused together at least in the countersink preselected configuration.

4,419,120

CONTROL OF PRICKLY SIDA, VELVETLEAF, AND SPURRED ANODA WITH FUNGAL PATHOGENS

Harrell L. Walker, Stoneville, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 10, 1982, Ser. No. 356,864

Int. Cl.³ A01N *63/00*

U.S. Cl. 71—79 **7 Claims**

1. A method for controlling multiple plant weeds of prickly sida, velvetleaf, and spurred anoda, comprising infesting agricultural fields with an effective amount of the fungus *Fusarium lateritium* to infect and produce typical lesions in and kill said multiple weeds.

4,419,121

N-PHENYLSULFONYL-N'-PYRIMIDINYLUREAS

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

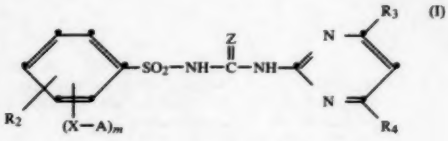
Continuation-in-part of Ser. No. 417,716, Sep. 13, 1982, abandoned, which is a division of Ser. No. 282,847, Jul. 13, 1981. This application Jan. 17, 1983, Ser. No. 458,584

Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81

Int. Cl.³ C07D *239/42;* **A01N** *43/54*

U.S. Cl. 71—92 **26 Claims**

1. A N-phenylsulfonyl-N'-pyrimidinylurea of the formula I



(I)

wherein

A is a C_1–C_6alkyl radical which is substituted by C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4alkylsulfinyl, or C_1–C_4-alkylsulfonyl,

X is oxygen, sulfur, a sulfinyl or sulfonyl bridge,

Z is oxygen or sulfur,

m is 1 or 2,

R_2 is hydrogen, halogen, C_1–C_5alkyl, C_2–C_5-alkenyl, C_1–C_4-haloalkyl, or a radical —Y—R_5, —$COOR_6$, —NO_2 or —CO—NR_7—R_8,

R_3 and R_4, each independently of the other, are hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4haloalkyl, halogen or alkoxyalkyl of at most 4 carbon atoms,

R_5 and R_6, each independently of the other, are C_1–C_5alkyl, C_2–C_5alkenyl or C_2–C_6alkynyl,

R_7 and R_8, each independently of the other, are hydrogen, C_1–C_5alkyl, C_2–C_5alkenyl or C_2–C_6alkynyl, and

Y is oxygen, sulfur, a sulfinyl or sulfonyl bridge, or a salt thereof.

4,419,122

HERBICIDAL 4-TRIFLUOROMETHYL-3'-OXYGEN-SUBSTITUTED-4'-SUBSTITUTED DIPHENYL ETHERS

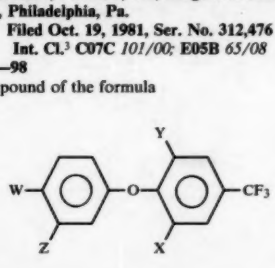
Colin Swithenbank, Perkasie, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 19, 1981, Ser. No. 312,476

Int. Cl.³ C07C *101/00;* **E05B** *65/08*

U.S. Cl. 71—98 **10 Claims**

1. A compound of the formula



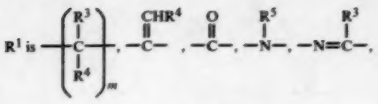
wherein

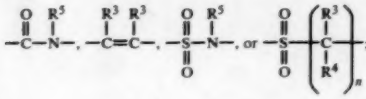
W is —NO_2, —CN, —SO_nCH_3 or a halogen atom,

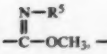
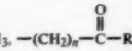
X is a hydrogen atom, a halogen atom, a trihalomethyl group, a (C_1–C_4)alkyl group, or a cyano group,

Y is a hydrogen atom, a halogen atom, or a trihalomethyl group, and

Z is —O—R^1—R^2 wherein

R^1 is  ;

 ;

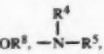
R^2 is —CN, —$C(OCH_3)_3$,  ,  ,

;

R^3 is —R^8, —Cl, —F, —CF_3, —CN, or —COR^6;

R^4 is —H, (C_1–C_4)alkyl, (C_1–C_4)alkoxy, —CN, —COR^6, —NH[(C_1–C_4)]alkyl, —N[(C_1–C_4)]$alkyl_2$, —$S(O)_nR^7$, or —CO_2R^8;

R^5 is —R^8, —CN, —SO_2R^7, or —CO_2R^8;

R^6 is —H, (C_1–C_4)alkyl, —OR^8,  ,

;

R^7 is (C_1–C_4)alkyl, carb(C_1–C_4)alkoxy, or —CF_3;

R^8 is H, (C_1–C_4)alkyl, (C_2–C_4)alkenyl, (C_2–C_4)alkynyl, (C_2–C_4)hydroxyalkyl, (C_1–C_4) alkoxy(C_2–C_4)alkyl, (C_1–C_4)alkylthio(C_1–C_4)alkyl, (C_1–C_4)alkylsulfinyl(C_1–C_4)alkyl, (C_1–C_4)alkylsulfonyl(C_1–C_4) alkyl, carboxy(C_1–C_4)alkyl, carb(C_1–C_4)alkoxy(C_1–C_4)alkyl, cyano(C_1–C_4)alkyl, or halo(C_1–C_4)alkyl;

m is separately selected from the integers 1, 2, 3 and 4 for each individually selected radical; and

n is separately selected from the integers 0, 1 and 2 for each individually selected radical;

including the agronomically-acceptable salts thereof, provided that no halogen atom shall be on a carbon atom which is α to an oxygen, nitrogen, or sulfur atom, and R^2 shall not be —SO_2R^7 when R^1 is

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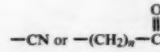
and that R^3 and R^4 shall both be other than —H or (C_1–C_4)alkyl when R^2 is

 .

6. A herbicidal composition comprising a herbicidally-effective amount of a compound according to claim 1 and an agronomically-acceptable carrier.

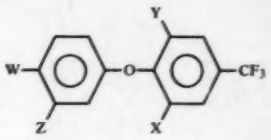
4,419,123

HERBICIDAL 4-TRIFLUOROMETHYL-3'-CARBON-SUBSTITUTED-4'-SUBSTITUTED DIPHENYL ETHERS

Colin Swithenbank, Perkasie, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 19, 1981, Ser. No. 312,454
Int. Cl.[3] C07C *101/00*; E05B *65/08*
U.S. Cl. 71—98 11 Claims

1. A compound of the formula



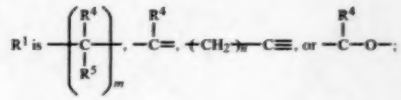
wherein

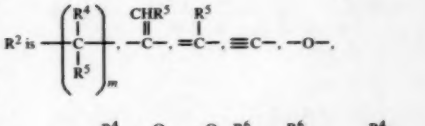
W is —NO_2, —CN, —SO_nCH_3 (wherein n=0, 1, or 2) or a halogen atom,

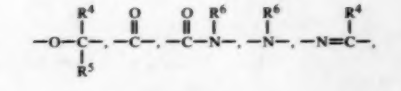
X is a hydrogen atom, a halogen atom, a trifluoromethyl group, a (C_1–C_4)alkyl group, or a cyano group,

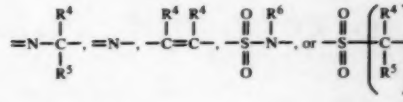
Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

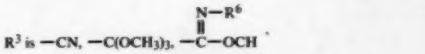
Z is —R^1—R^2—R^3 wherein

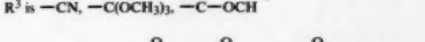
R^1 is  ;

R^2 is  ;

 ;

 ;

R^3 is —CN, —$C(OCH_3)_3$,  ,

 ;

R^4 is —R^9, —Cl, —F, —CF_3, —CN, or —COR^7;

R^5 is —H, (C_1–C_4)alkyl, (C_1–C_4)alkoxy, —CN, —COR^7, —NH[(C_1–C_4)]alkyl, —N[(C_1–C_4)]$alkyl_2$, —$S(O)_nR^8$, or —CO_2R^9;

R^6 is —R^9, —CN, —SO_2R^8, or —CO_2R^9;

R^7 is —H, (C_1–C_4)alkyl, —OR^9, ,

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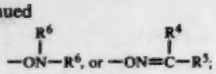


R^8 is (C_1–C_4)alkyl, carb(C_1–C_4)alkoxy, or $—CF_3$;

R^9 is —H, (C_1–C_4)alkyl, (C_2–C_4)alkenyl), (C_2–C_4)alkynyl, (C_2–C_4)hydroxyalkyl, (C_1–C_4)alkoxy(C_2–C_4)alkyl, (C_1–C_4)alkylthio(C_1–C_4)alkyl, (C_1–C_4)alkylsulfinyl(C_1–C_4)alkyl, (C_1–C_4)alkylsulfonyl(C_1–C_4)alkyl, carboxy(C_1–C_4)alkyl, carb(C_1–C_4)alkoxy(C_1–C_4)alkyl, cyano(C_1–C_4)alkyl, or halo(C_1–C_4)alkyl;

m is separately selected from the integers 1, 2, 3 and 4 for each individually selected radical; and

n is separately selected from the integers 0, 1 and 2 for each individually selected radical;

including the agronomically-acceptable salts thereof, with the provisos that (a) no oxygen atom shall be bonded to another oxygen atom, (b) no sulfur atom shall be bonded to another sulfur atom, (c) no halogen atom shall be on a carbon atom which is α to an oxygen, nitrogen or sulfur atom, (d) R^7 shall not be $—NR^5R^6$ when R^2 is =N—, (e) R^4 and R^5 shall not both be —H or —Cl when $—R^1—R^2$ is

and (f) R^1 and R^2 shall not both be

.

6. A herbicidal composition comprising a herbicidally-effective amount of a compound according to claim 1 and an agronomically-acceptable carrier.

4,419,124

HERBICIDAL 4-TRIFLUOROMETHYL-3'-NITROGEN-SUBSTITUTED-4'-SUBSTITUTED DIPHENYL ETHERS

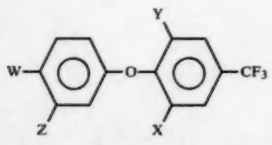
Colin Swithenbank, Perkasie, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 19, 1981, Ser. No. 312,453

Int. Cl.[3] **C07C** *101/00;* **E05B** *65/08*

U.S. Cl. 71—98 **10 Claims**

1. A compound of the formula



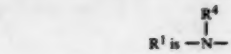
wherein

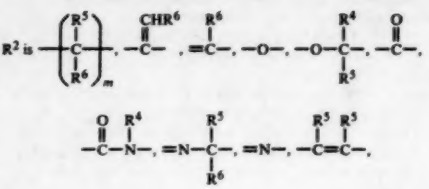
W is $—NO_2$, —CN, $—SO_nCH_3$ (wherein n=0, 1, or 2) or a halogen atom,

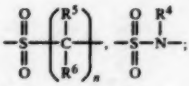
X is a hydrogen atom, a halogen atom, preferably a fluorine atom or a chlorine atom, a trihalomethyl group, preferably a trifluoromethyl group, a (C_1–C_4)alkyl group, preferably a methyl group, or a cyano group,

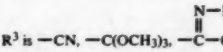
Y is a hydrogen atom, a halogen atom, preferably a fluorine atom or a chlorine atom, or a trihalomethyl group, preferably a trifluoromethyl group, and

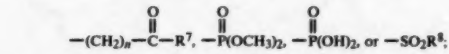
Z is $—R^1—R^2—R^3$ wherein







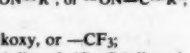




R^4 is $—R^9$, —Cl, —F, $—CF_3$, —CN, or $—COR^7$;

R^5 is —H, (C_1–C_4)alkyl, (C_1–C_4)alkoxy, —CN, $—COR^7$, $—NH[(C_1–C_4)]alkyl$, $—N[(C_1–C_4)]alkyl_2$, $—S(O)_nR^8$, or $—CO_2R^9$;

R^6 is $—R^9$, —CN, $—SO_2R^8$, or $—CO_2R^9$;



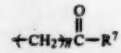
R^8 is (C_1–C_4)alkyl, carb(C_1–C_4)alkoxy, or $—CF_3$;

R^9 is —H, (C_1–C_4)alkyl, (C_214 C_4)alkenyl, (C_2–C_4)alkynyl, (C_2–C_4)hydroxyalkyl, (C_1–C_4)alkoxy(C_2–C_4)alkyl, (C_1–C_4)alkylthio(C_1–C_4)alkyl, (C_1–C_4)alkylsulfinyl(C_1–C_4)alkyl, (C_1–C_4)alkylsulfonyl(C_1–C_4)alkyl, carboxy(C_1–C_4)alkyl, carb(C_1–C_4)alkoxy(C_1–C_4)alkyl, cyano(C_1–C_4)alkyl, or halo(C_1–C_4)alkyl;

m is separately selected from the integers 1, 2, 3 and 4 for each individually selected radical; and

n is separately selected from the integers 0, 1 and 2 for each individually selected radical;

including the agronomically-acceptable salts thereof, with the provisos that no oxygen atom shall be bonded to another oxygen atom, no sulfur atom shall be bonded to another sulfur atom, no halogen atom shall be on a carbon atom which is a α to an oxygen nitrogen or sulfur atom, and the sum of m plus n is at least 2 when R^3 is



and R^7 is $—OR^9$ or $—NR^4R^6$.

6. A herbicidal composition comprising a herbicidally-effective amount of a compound according to claim 1 and an agronomically-acceptable carrier.

4,419,125

METHOD FOR THE PREPARATION OF BRITTLE SUPERCONDUCTING MATERIAL IN ULTRAFINE PARTICLE FORM

Robert G. Charles, Hampton, and John R. Gavaler, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1982, Ser. No. 436,103
Int. Cl.³ H01L *39/12*
U.S. Cl. 75—0.5 B 13 Claims

1. A method of preparing submicron particles of superconducting powder, said method comprising:

(a) preparing a mixture of metal halides, the metal components of said halides being in essentially stoichiometric proportions for the desired superconducting compound;

(b) co-reducing said mixture of metal halides with an excess of liquid alkali metal to produce a metallic compound powder and an alkali metal halide;

(c) removing said alkali metal halide and the excess alkali metal from said powder;

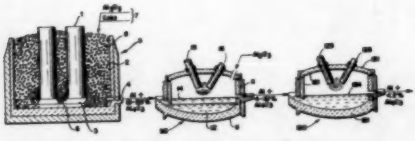
(d) annealing said powder to render said powder superconducting at essentially the theoretical temperature of said compound whereby a superconducting powder is produced which is generally spherical and can be used to form a ductile superconductor wire.

4,419,126

ALUMINUM PURIFICATION SYSTEM

Robert M. Kibby, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 7,986, Jan. 31, 1979, Pat. No. 4,216,010, which is a continuation-in-part of Ser. No. 881,786, Feb. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 785,676, Apr. 7, 1977, abandoned. This application Jun. 20, 1980, Ser. No. 161,292
Int. Cl.³ C22B *21/02*
U.S. Cl. 75—10 R 10 Claims



1. A process for decreasing aluminum carbide contamination of aluminum produced by carbothermic processes, said process comprising:

A. preparing said aluminum contaminated with about 10–20 weight percent aluminum carbide as a melt at an initial temperature sufficiently high to keep said melt in a fluid state;

B. contacting said melt with a high-alumina containing molten slag in the absence of reactive carbon so as to cause the alumina-containing slag to react with the aluminum carbide in said melt until a partially purified aluminum containing 4–10% aluminum carbide is produced;

C. continuing to heat said partially purified aluminum in the absence of both said carbon and said slag to produce a purified aluminum containing less than 4% aluminum carbide by weight; and

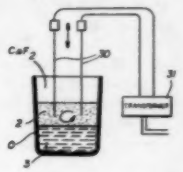
D. recovering said purified aluminum.

4,419,127

METALLOTHERMAL PROCESS FOR REDUCING METAL OXIDES

Aloyse Tanson, Luxembourg, Luxembourg, assignor to Continental Alloys A.A., Dommeldange, Luxembourg

Filed May 11, 1982, Ser. No. 377,034
Claims priority, application Luxembourg, May 13, 1981, 83361
Int. Cl.³ C22B *4/00*
U.S. Cl. 75—10 R 9 Claims



1. A method of producing metal from a metal oxide which comprises the steps of:

(a) forming an ignitable autogenously reactive mixture containing said metal oxide and at least one metallic reducing agent for said metal oxide, igniting said mixture from the top with an ignition source to initiate a reaction within the mixture, and then permitting the reaction within said mixture to proceed autogenously to produce a molten metal phase surmounted by a slag phase;

(b) while said slag phase is retained and remains liquid but after burnout of the reaction in step (a), introducing at least one pair of electrodes into said slag phase and passing an alternating current through said slag phase between said electrodes to heat said slag phase and induce further reaction of residual metal oxide therein whereby metal from said metal oxide migrates to said metal phase; and

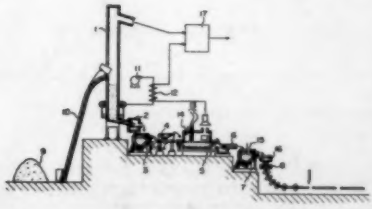
(c) adding a required amount of metallic reducing agent to said slag phase at an empirically determined rate during the heating in step (b).

4,419,128

CONTINUOUS MELTING, REFINING AND CASTING PROCESS

Ryuichi Nakagawa, Seki; Shiro Yoshimatsu, Tokyo; Akira Fukuzawa, Funabashi; Akira Sato, and Tsuyoshi Ozaki, both of Ohmiya, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 358,908
Int. Cl.³ C21C *5/32*
U.S. Cl. 75—46 19 Claims



1. In a continuous melting, refining and casting process for the production of steel from steel scrap, iron scrap and/or reduced iron by performing the following steps, substantially in series: a step of melting and carburizing steel scrap, iron scrap and/or reduced iron as a raw material in a combustion-type melting furnace, a refining step including oxidation by

gaseous oxygen, a refining and holding step, and a continuous casting step, the improvement which comprises

using a cupola as the combustion type melting furnace for simultaneously melting and carburizing steel scrap,

continuously charging the molten metal from the cupola to an intermediate holding step in a holding furnace,

holding the molten metal in the holding furnace for a period of time sufficient to reduce variations in flow rate, temperature and chemical composition of the molten metal,

continuously feeding the molten metal from the holding furnace to the refining step at a predetermined flow rate, and

controlling the refining conditions in the refining step according to one or more of the characteristics of the molten metal in the intermediate holding step,

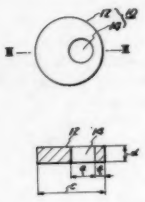
whereby the variations in quality of the steel product can be controlled within narrow limits.

4,419,129

HEAT RESISTANT CAST IRON-NICKEL-CHROMIUM ALLOY

Junichi Sugitani, Hirakata; Teruo Yoshimoto, Suita, and Makoto Takahashi, Hirakata, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Dec. 22, 1981, Ser. No. 333,472
Claims priority, application Japan, Jan. 12, 1981, 56-3602
Int. Cl.³ C22C *30/00*
U.S. Cl. 420—584 **2 Claims**



1. A heat resistant cast iron-nickel-chromium alloy consisting essentially of the following components in the following proportions in terms of % by weight:

C	0.3–0.6,
O < Si ≦	2.0,
O < Mn ≦	2.0,
Cr	20–30,
Ni	30–40,
Nb + Ta	0.3–1.5,
N	0.04–0.15,
B	0.0002–0.004,
Ti	0.04–0.50 and
Al	0.02–0.50,

the balance being substantially Fe.

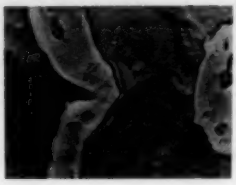
4,419,130

TITANIUM-DIBORIDE DISPERSION STRENGTHENED IRON MATERIALS

Edward R. Slaughter, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 75,047, Sep. 12, 1979, abandoned. This application Nov. 19, 1980, Ser. No. 208,375
Int. Cl.³ C22C *38/56*
U.S. Cl. 75—244 **12 Claims**

1. A high strength iron base material consisting of a ferrite matrix which contains from about 0.2 to about 10 weight percent of XB_2 precipitate particles where X is selected from the group consisting of titanium, zirconium, and hafnium and



mixtures thereof, with the particles being present in a number density of at least 10^{10} per mm^3.

4,419,131

FLUX FOR CONTINUOUS CASTING

Charles M. Loane, Jr., Bel Air, Md., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed May 14, 1981, Ser. No. 263,645
Int. Cl.³ C22B *9/10*
U.S. Cl. 75—257 **6 Claims**

1. A process for the production of granular flux comprising mixing a particulate glass frit and carbon black until the frit particles are coated with substantially all of the carbon black wherein substantially all of the particulate glass frit has a particle size within the range of 0.5 to 4 mm.

4,419,132

PRINTING INK

John T. Moynihan, Phillipsburg, N.J., assignor to American Newspaper Publishers Association, Easton, Pa.

Filed Jan. 6, 1982, Ser. No. 337,220
Int. Cl.³ C09D *11/06*
U.S. Cl. 106—27 **7 Claims**

1. A printing ink consisting essentially of:

a. Carbon black pigment 16.5%

b. Gilsonite 25.1%, and

c. Tall oil fatty acid 58.4%.

4,419,133

BONDED AGGREGATE STRUCTURES AND PRODUCTION THEREOF

Calvin Shubow, Farmington, Mich., and Robert V. Skinner, Glen Ellyn, Ill., assignors to Quadco Component Systems, Inc., Livonia, Mich.

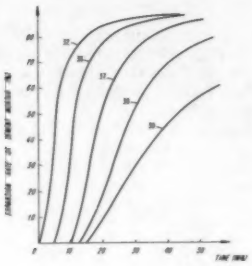
Filed Nov. 27, 1981, Ser. No. 325,393
Int. Cl.³ C04B *9/04*
U.S. Cl. 106—85 **23 Claims**

1. A bonded aggregate structure obtained by establishing a non-ammoniacal workable mixture of magnesium oxide, aluminum oxide, aggregate, and aqueous mono aluminum phosphate acidic solution, the weight ratio of aluminum oxide to acidic solution (expressed as 50% solution with P_2O_5:Al_2O_3 of about 4) being from about 1:1 to about 1:3, the weight ratio of magnesium oxide to aluminum oxide being from about 1:1 to about 1:6, and the quantity of acidic solution relative to the total mixture being sufficient prior to setting to impart lubricity to the mixture; working the mixture into a predetermined form, and allowing the thus worked form to set into a rigid structure.

4,419,134
ORGANIC PHOSPHORIC ESTER CONTAINING WATER-DISPERSIBLE ALUMINUM PASTE AS FOAMING AGENT IN LIGHT-WEIGHT FOAMED CONCRETE

Shizuo Ishijima, Mishima; Takeshi Kiritani, Yokohama, and Yukio Hayashi, Fujinomiya, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

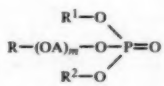
Division of Ser. No. 152,294, May 22, 1980, Pat. No. 4,350,535. This application Jul. 1, 1982, Ser. No. 394,123
Claims priority, application Japan, May 28, 1979, 54-65007
Int. Cl.³ C04B 1/00
U.S. Cl. 106—87 9 Claims



1. In the production of light-weight foamed concrete comprising mixing a concrete-forming composition and a foaming agent, and allowing the foamed concrete to set, the improvement which comprises employing, as said foaming agent, a water-dispersible aluminum paste composition comprising:

(a) aluminum powder, and;

(b) from 0.1 to 20% by weight, based on the weight of the aluminum powder, of at least one organic phosphoric ester having a general formula:



[I]

where R represents an alkyl group having 6 to 24 carbon atoms, an alkenyl group having 6 to 24 carbon atoms or an aryl group containing at least one alkyl substituent having 6 to 24 carbon atoms or at least one alkenyl substituent having 6 to 24 carbon atoms, A represents an alkylene group having 2 to 4 carbon atoms, m represents an integer of from 0 to 20, and R^1 and R^2 independently represent hydrogen, an alkyl group having 1 to 24 carbon atoms, an alkenyl group having 1 to 24 carbon atoms, an aryl group having 6 to 24 carbon atoms or $R—(OA)_m$ (R, A and m are the same as set forth above).

4,419,135
METHOD OF PREPARING CEMENTITIOUS COMPOSITIONS FOR TUNNEL BACKFILL

John H. Hoge, Cincinnati, Ohio, assignor to Molecrete Corporation, Cincinnati, Ohio

Filed Oct. 6, 1981, Ser. No. 309,019
Int. Cl.³ C04B 7/35
U.S. Cl. 106—88 28 Claims

1. A method for preparing a highly flowable cohesive sealing grout for backfilling tunnels and similar underground structures comprising the steps of:

(a) charging a mixing means with 6 to 8 parts by weight of sand;

(b) adding to said sand 1½ to 3 parts by weight of water and 3 to 6 parts by weight of cement while maintaining the mixing agitation to form a grout;

(c) adding to said grout 0.01 to 0.05 parts by weight of a plasticizing agent selected from the class of water soluble metal salts consisting of the condensation products of an aldehyde and an aromatic sulfonic acid to form a plasticized grout;

(d) maintaining said plasticized grout in a state of agitation while adding concurrently 6 to 8 parts of sand and 0.02 to 0.04 parts by weight of a pituitous water soluble polyethylene oxide thickening compund having a molecular weight of about 2 million to about 7 million;

(e) agitating said plasticized grout for a period of time that will insure uniform dispersion of all ingredients; and

(f) discharging said grout into means for placing it promptly at the desired point of use.

4,419,136
EXPANSIVE CEMENT

Edward K. Rice, 2077 Linda Flora Dr., Los Angeles, Calif. 90024

Filed Feb. 10, 1982, Ser. No. 347,560
Int. Cl.³ C04B 7/35
U.S. Cl. 106—89 14 Claims

1. A method of forming an improved expansive cement comprising:

separately grinding an expansive clinker containing a stable calcium alumino sulfate compound to a controlled particle size having a selected surface area greater than about 4600 sq. cm/gm; and

blending said expansive clinker with a ground cement clinker and with gypsum to form said expansive cement.

4,419,137
CORROSION INHIBITORS, METHOD OF PRODUCING AND PROTECTIVE COATINGS CONTAINING SAME

Richard A. Cayless, London, and David A. Pippard, Hampton Hill, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Jul. 28, 1981, Ser. No. 287,635
Claims priority, application United Kingdom, Aug. 9, 1980, 8026031
Int. Cl.³ C09D 5/08
U.S. Cl. 106—14.39 15 Claims

1. A corrosion inhibitor comprising particles of an inorganic oxide selected from the group consisting of silica and alumina, having corrosion inhibiting metal cations chemically bound to the surface of the particles by ion exchange with protons from hydroxyl groups on said surface, whereby said cations bound to said particles can only be released by further ion exchange.

4,419,138
ACCELERATOR ADDITIVE FOR CEMENTITIOUS COMPOSITIONS

Sandor Popovics, 283 Congress Ave., Lansdowne, Pa. 19050

Filed Sep. 18, 1981, Ser. No. 303,482
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 15 Claims

1. A method for accelerating the hardening of a quantity of a settable cementitious material comprising:

selecting a quantity of cementitious material; and

mixing from about 0.5% to about 10% by weight formic acid with said cementitious material.

4,419,139
PROCESS FOR PREPARING COATING BINDERS FROM VEGETABLE OIL MATERIAL

Jan W. Gooch, Gladstone, Mo.; B. George Bufkin, Tipp City, Ohio, and Gary C. Wildman, Hattiesburg, Miss., assignors to University of Southern Mississippi, Hattiesburg, Miss.

Filed Mar. 24, 1982, Ser. No. 361,272
Int. Cl.³ C09D *3/28, 3/64, 3/72, 5/02*
U.S. Cl. 106—252 **15 Claims**

1. A process of preparing a coating binder from a vegetable oil alkyd comprising
- introducing an alkyd of which about 60% of its fatty acid moieties are unsaturated and an oxygen permeable emulsifying agent into an aqueous medium,
- emulsifying said alkyd in said aqueous medium to encapsulate said alkyd in particles having an oxygen permeable outer layer of said emulsifying agent,
- subjecting said particles to shear force to adjust the average particle size to below about 1 micron in diameter,
- adjusting the pH of said emulsion to between about 2.5 and about 6.0, and
- contacting said emulsion with an oxygen-containing gas at pressures of between about 1 atmosphere and about 10 atmospheres to effect autoxidation of said alkyd sufficient to cross-link said alkyd until the swelling ratio of said emulsified particles is between about 10 and about 3, gelling or nearly gelling said particles.

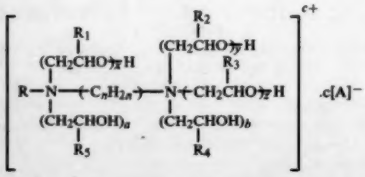
10. A process of preparing a coating binder from a vegetable oil comprising
- introducing an oil, wherein above about 60% of the fatty acid moieties of said oil are unsaturated, and an oxygen permeable emulsifying agent into an aqueous medium,
- emulsifying said oil in said aqueous medium to encapsulate said oil in particles having an oxygen permeable outer layer of said emulsifying agent,
- subjecting said particles to shear force to adjust the average particle size to below about 1 micron in diameter,
- adjusting the pH of said emulsion to between about 2.5 and about 6.0, and
- contacting said emulsion with an oxygen-containing gas at pressures between about 1 atmosphere and about 10 atmospheres to effect autoxidation of said oil sufficient to cross-link said oil until the swelling ratio of said emulsified particles is between about 10 and about 3, gelling or nearly gelling said particles.

4,419,140
ALKOXYLATED DIQUATERNARY AMMONIUM COMPOUNDS

James M. Richmond, Naperville; Richard A. Reck, Hinsdale, and Gary A. Bernard, Bolingbrook, all of Ill., assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 162,570, Jun. 24, 1980, Pat. No. 4,313,895.
This application May 8, 1981, Ser. No. 261,840
Int. Cl.³ C08L *95/00*
U.S. Cl. 106—273 N **10 Claims**

1. An asphalt emulsion comprising:
(a) a bituminous binder
(b) water
(c) an emulsifying amount of an emulsifying agent of the formula



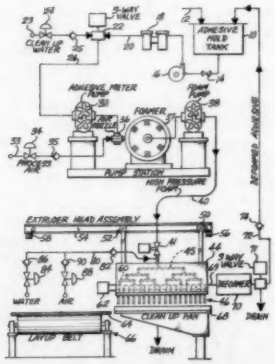
wherein R is selected from a group of aliphatic radicals containing from about 6 to about 22 carbon atoms; n is an integer of from 2 to 6; R_1, R_2, R_3, R_4 and R_5 are independently selected from the group consisting of hydrogen, methyl and ethyl; x, y and z are independently integers of from 1 to 50; a and b are independently 0 or 1, provided that the sum of a+b is greater than zero; and c is the sum of a+b; and A is a

radical wherein Z is lower alkyl, lower hydroxyalkyl or lower chloroalkyl.

4,419,141
CLEANING LABYRINTHINE SYSTEM WITH FOAMED SOLVENT AND PULSED GAS

Arden L. Kunkel, Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Apr. 5, 1982, Ser. No. 365,121
Int. Cl.³ B08B *9/00*
U.S. Cl. 134—22.12 **10 Claims**



1. A method of cleaning a viscous substance from a labyrinthine channel system which comprises:
a. flushing the system with a liquid solvent for the substance, said solvent being a continuous phase containing discrete bubbles of a suspended gas in a ratio of at least one volume of gas for each three volumes of liquid, and
b. injecting additional gas into the system in the form of regular discrete pulses during which pulse time the gaseous phase becomes the continuous phase.

4,419,142
METHOD OF FORMING DIELECTRIC ISOLATION OF DEVICE REGIONS

Naohiro Matsukawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

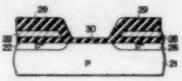
Filed Oct. 20, 1981, Ser. No. 313,324
Claims priority, application Japan, Oct. 24, 1980, 55-148363; Oct. 31, 1980, 55-153250; Jul. 3, 1981, 56-104122
Int. Cl.³ H01L *21/312;* **C03C** *15/00;* **B01J** *17/00*
U.S. Cl. 148—1.5 **13 Claims**

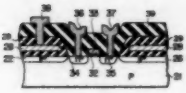
1. A method of manufacturing a semiconductor device which comprises the steps of:
(a) depositing on a semiconductor substrate a layer of a material which is oxidized more quickly than said semiconductor substrate;
(b) selectively oxidizing that portion of said more quickly oxidizable material layer which is located on the element

region of the semiconductor substrate to provide an oxidized layer;

(c) removing at least part of said oxidized layer deposited on the element region of the semiconductor substrate;

(d) wet oxidizing the retained layer of said more quickly oxidizable material to produce an element-isolating oxide





layer with a greater thickness than a remaining oxidized layer on the element region of the semiconductor substrate; and

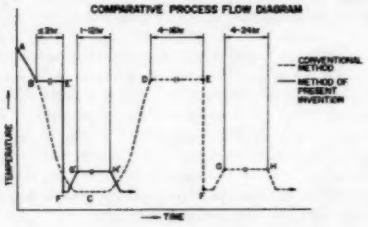
(e) removing the remaining oxidized layer on the element region of the semiconductor substrate to expose said region.

4,419,143

METHOD FOR MANUFACTURE OF ALUMINUM ALLOY CASTING

Tadao Ito, Fuji, and Akio Hashimoto, Numazu, both of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Nov. 16, 1981, Ser. No. 321,882
Int. Cl.³ C22F *1/04*
U.S. Cl. 148—3 **5 Claims**



1. A method for the manufacture of a cast article of aluminum alloy, which comprises the steps of (a) pouring into a metal mold a molten Al-Si-Cu type or Al-Si-Cu-Mg type casting alloy containing antimony (Sb) in the range of 0.03–1.0% by weight; (b) after complete solidification of the alloy cast body in the mold but before it has cooled below about 450° C., placing said cast body in a heating furnace kept at temperatures in the range of from 480° to 530° C. and retaining it therein for a short period up to two hours; (c) then quenching said cast body; and (d) finally subjecting it to a treatment for artificial aging at temperatures in the range of about 140°–230° C. for not less than one hour.

4,419,144

SPALL-RESISTANT STEEL TUBING OR OTHER STEEL ARTICLES SUBJECTED TO HIGH TEMPERATURE STEAM AND METHOD

William R. Apblett, Jr., Florham Park, and Irwin M. Rehn, Boonton, both of N.J., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 16, 1980, Ser. No. 159,682
Int. Cl.³ C23F *7/26*
U.S. Cl. 148—6.2 **13 Claims**

1. In a process in which a surface of a ferritic steel member is subjected to relatively high temperature air or steam for a period of time resulting in the formation of a duplex scale layer of steam-grown oxide at said surface, a method of reducing the possibility of scale spalling at said surface in response to thermal stress, said method comprising: pretreating said surface with particular substances including a non-corrosive chromate compound in a particular way to cause the formation of a chromite spinel barrier at the center of said duplex layer during formation of the latter, said barrier retarding the rate at which said duplex scale layer forms at said surface during said period, thereby reducing said possibility of scale spalling, said step of pretreating said surface including the steps of applying to said surface a solution selected from one or more non-corrosive compounds in the group consisting of potassium and sodium chromate and dichromate; confining said surface and applied solution to an environment including a predetermined gas; subjecting said solution applied surface in said environment to a predetermined pressure at a predetermined temperature for a predetermined period of time; and thereafter cooling said surface.

4,419,145

PROCESS FOR PRODUCING Nb_3SN SUPERCONDUCTOR

Kyoji Tachikawa, Tokyo; Hisashi Sekine; Kikuo Itoh, both of Sakura, and Yasuo Iijima, Tsukuba, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,581
Int. Cl.³ H01L *39/00*
U.S. Cl. 148—11.5 F **8 Claims**

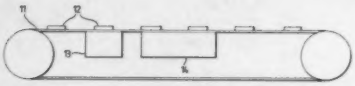
1. In a process for producing a Nb_3Sn superconductor which comprises drawing a composite composed of a core of niobium or a niobium alloy and at least one matrix of a copper-tin alloy and subjecting the drawn composite to reactive heat-treatment, thereby forming a layer of Nb_3Sn between the core and the matrix; the improvement wherein the copper-tin alloy contains 1 to 15 atomic percent of tin, and 0.1 to 8 atomic percent in total of at least one element selected from the group consisting of 0.1 to 8 atomic percent of titanium, 0.1 to 5 atomic percent of zirconium and 0.1 to 5 atomic percent of hafnium.

4,419,146

SOLDER FLUX COMPOSITIONS

Daniel F. T. Roberts, Walden, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,409
Int. Cl.³ B23K *35/36*
U.S. Cl. 148—23 **9 Claims**



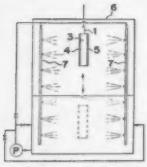
1. A flux composition comprising a dispersion of an amount of finely divided particles of a material selected from the group consisting of liquid and solid flux materials, said particles being dispersed, in a form selected from the group consisting of an emulsion and a suspension, in an amount of liquid carrier material in which all of said amount of said flux material is insoluble, wherein said dispersion consists essentially of a mixture of tartaric acid and sarcosine as said flux material and, as said liquid carrier material, a material selected from the group consisting of isopropyl alcohol and a mixture of water and isopropyl alcohol.

4,419,147

PHOSPHATING PROCESS OF METAL SURFACE

Ryoichi Murakami; Hideo Shimizu; Takashi Yoshii; Minoru Ishida, and Hiroto Yonekura, all of Neyagawa, Japan, assignors to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 121,168, Feb. 13, 1980, Pat. No. 4,292,096. This application Apr. 6, 1981, Ser. No. 251,147
Claims priority, application Japan, Feb. 13, 1979, 54-15839
Int. Cl.³ C23F *7/08*
U.S. Cl. 148—31.5 **1 Claim**



1. A metal substrate having a fine phosphate film of 1.5 to 3 grams /m^2 on the surface thereof, said phosphate film having a cubic crystalline structure suitable for cationic electrocoating, said metal substrate formed by first dipping the metal surface into an acidic phosphating solution consisting essentially of a zinc compound in a concentration of 0.5 to 1.5 g/l as a zinc ion, a phosphate in a concentration of 5 to 30 g/l as a phosphate ion and a nitrite in a concentration of 0.01 to 0.2 g/l as a nitrite ion and a chlorate in a concentration of 0.05 to 2 g/l as a chlorate ion, at a temperature of 40° to 70° C. for not less than 15 seconds and then spraying the metal surface with said acidic phosphate for not less than 2 seconds.

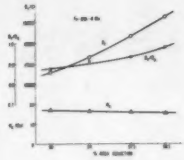
4,419,148

HIGH-REMANENCE FE-NI AND FE-NI-MN ALLOYS FOR MAGNETICALLY ACTUATED DEVICES

Sungho Jin, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 142,634, Apr. 22, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,512
Int. Cl.³ H01F *1/00*
U.S. Cl. 148—120 **8 Claims**

1. Method for making a magnetic element consisting essentially of a body of a metallic alloy having a magnetic squareness ratio which is greater than 0.7 and having remanent magnetic induction which is greater than 7000 gauss, said method being characterized by the steps of (1) plastically deforming a metallic body consisting essentially of an alloy comprising an amount of at least 98 weight percent, Fe, Ni, and Mn, Ni being in the range of 6–20 weight percent of said amount, and Mn being less than or equal to 8 weight percent of said amount, deforming being by uniaxial elongation by an amount corresponding to an area reduction which is greater than or equal to 50 percent, (2) aging said body at a temperature corresponding to an essentially two-phase state of said alloy, (3) plasticially deforming said body by uniaxial elongation by an amount corresponding to an area reduction which is greater than or equal to 80 percent, and (4) aging said body at a temperature corresponding to an essentially two-phase state of said alloy.

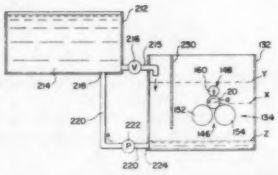


4,419,149

METHOD FOR QUENCHING HEATED WORKPIECES

Paul L. Day, Parma, Ohio, assignor to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Division of Ser. No. 113,691, Jan. 21, 1980, Pat. No. 4,336,924. This application Aug. 19, 1981, Ser. No. 234,201
Int. Cl.³ C21D *9/00*
U.S. Cl. 148—131 **3 Claims**



1. A method of quenching a heated elongated workpiece having a central axis and spaced ends, the method comprising the steps of: providing a quench tank, providing workpiece supporting and rotating means at a fixed position in said tank, locating a heated workpiece at said selected fixed position in said quench tank, rotating said workpiece at said fixed position about said central axis, preventing transverse deflection of said workpiece as said workpiece is rotating at said fixed position, rapidly flooding said quench tank with a quenching liquid to a level above said selected position while said workpiece rotates at said selected fixed position and about said central axis whereby said workpiece is quenched, and forcing said quenching liquid from said quench tank to a level below said selected position after said workpiece is quenched.

4,419,150

METHOD OF FORMING LATERAL BIPOLAR TRANSISTORS

Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

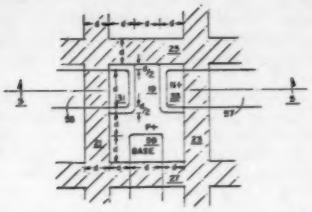
Division of Ser. No. 220,399, Dec. 29, 1980. This application Sep. 16, 1982, Ser. No. 418,862
Int. Cl.³ H01L *21/22, 21/265*
U.S. Cl. 148—187 **5 Claims**

1. The method of making a NPN lateral transistor on an N doped substrate, comprising the steps of:

forming a recess in the substrate bounding the region for the transistor;

N+ doping spaced apart portions of said regions;

P doping the non-N+ doped portions of said region; filling said recess with field oxide; and,



establishing electrical connections to each of said N+ spaced apart portions and to the P doped non-N+ doped portions of said region.

4,419,151

CRYSTAL AND GERMANIUM MODIFICATION AND PROCESS FOR ITS PREPARATION

Andreas Grüttner; Reinhard Nesper, both of Stuttgart, and Hans-Georg von Schnering, Aidlingen, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,476

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 3109229

Int. Cl.³ C22B *41/00*

U.S. Cl. 148—400 **16 Claims**

1. Crystalline modification of germanium, characterized by plates of metallic luster with an orthorhombic structure.

7. Method of manufacturing the germanium modification of claim 1 comprising melting together lithium and germanium in the ratio of 0.01:1 Li:Ge 1:1, cooling the melt, isolating a crystalline lithium-germanium compound of orthorhombic structure from the melt, and hydrolyzing the lithium-germanium compound with protic solvents and/or mild oxidizing agents.

4,419,152

PROCESS FOR DIRECT HEAT TREATMENT OF TRACK LINKS FOR TRACTORS OR TRACKED VEHICLES

Walter Grilli; Franco De Meo, and Ivan Franchini, all of Modena, Italy, assignors to Italtractor ITM S.p.A., Castel Vetro, Italy

Filed Jun. 15, 1982, Ser. No. 388,715

Claims priority, application Italy, Jul. 21, 1981, 48934 A/81

Int. Cl.³ C21D *8/00*

U.S. Cl. 148—12 F **9 Claims**

1. Process for the manufacture of steel track links for tracked vehicles, comprising forging steel track links at an initial forging temperature of 1150°–1200° C. for 45–60 seconds with a finish forging temperature of 950°–1050° C., subjecting the links thus-produced to initial cooling at a rate of 2°–4° C./s to a temperature of 720°–830° C., maintaining the links at a temperature of 800°–850° C. for 2–3 minutes, again cooling the links at a rate of 10°–15° C./s to a second temperature of 180°–380° C., and maintaining the links at said second temperature for a period of 10–20 minutes, the steel having the following weight percent compositions:

C: 0.30–0.38
Mn: 1.00–1.50
Cr: up to 0.60
Si: 0.15–0.35
S+P: about 0.06
balance essentially iron.

4,419,153

PYROTECHNICAL DELAY CHARGE

Tore Boberg, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed May 13, 1982, Ser. No. 377,888

Claims priority, application Sweden, May 21, 1981, 8103208

Int. Cl.³ C06B *43/00*

U.S. Cl. 149—22 **20 Claims**

1. A pyrotechnical delay charge for rates of burning between 2 and 30 mm/s which comprises at least 10% by weight tin dioxide (SnO_2) as an oxidizer and slag former; 2 to 20% by weight of a fuel containing a member from the group of titanium and zirconium; and 40 to 70% by weight of bismuth trioxide.

4,419,154

DELAY COMPOSITION FOR DETONATORS

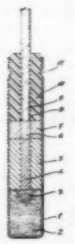
Alan L. Davitt, Brownsburg, and Kenneth A. Yuill, Alfred, both of Canada, assignors to CXA Ltd/CXA LTEE, North York, Canada

Filed May 18, 1981, Ser. No. 264,280

Claims priority, application Canada, Dec. 17, 1980, 366968

Int. Cl.³ C06B *33/12*

U.S. Cl. 149—40 **5 Claims**



1. A pyrotechnic delay composition adapted for non-electric and electric delay detonators comprising from 45% to 70% by weight of particulate barium sulphate and from 30% to 55% by weight of particulate silicon.

4,419,155

METHOD FOR PREPARING TERNARY MIXTURES OF ETHYLENEDIAMINE DINITRATE, AMMONIUM NITRATE AND POTASSIUM NITRATE

Kerry L. Wagaman; Chester F. Clark, both of Waldorf, Md.; Larry D. Henderson, San Jose, Calif., and W. Steven Jones, Indian Head, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1983, Ser. No. 491,462

Int. Cl.³ D03D *23/00*

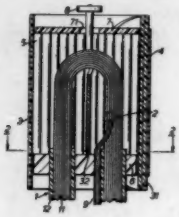
U.S. Cl. 149—109.6 **19 Claims**

1. A method for synthesizing a ternary mixture of ethylenediamine dinitrate, ammonium nitrate, and potassium nitrate which comprises admixing, at a temperature from about 40° to about 130° C., approximately stoichiometric amounts of aqueous nitric acid, ammonia, ethylenediamine, and potassium hydroxise, to form said ternary nitrate mixture.

4,419,156
METHOD OF ENCAPSULATION

Stephen H. Diaz, Los Altos Hills, and David A. Horsma, Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 798,130, May 18, 1977. This application May 8, 1978, Ser. No. 903,961
Int. Cl.³ B60B *9/10*
U.S. Cl. 156—49 **11 Claims**



1. A method of encapsulating a cable splice between at least two electrical cables, said cable splice comprising at least two joints between insulated electrical conductors, each joint comprising an insulating sleeve which overlies the joint and the insulation of the joined-together conductors, the method comprising the steps of

(1) preparing an assembly by the steps of

(a) enveloping said cable splice within a closure member which forms an enclosure around the cable splice and which has at least one aperture of closed cross-section through which passes at least one of the cables forming that cable splice; and

(b) placing sealing material and a heater within said enclosure, the heater being wound around and through the sealing material and the joints between the insulated conductors;

(2) supplying heat to said assembly, at least in part from said heater, to change the viscosity of said sealing material and maintaining the sealing material at an elevated temperature for a sufficient time that if forms a waterproof seal around substantially all the joints; and

(3) cooling said assembly;

said sealing material (a) having, at a stage before completion of step (2), a viscosity such that it flows between and around and into sealing contact with substantially all of the joints of the cable splice within the enclosure, and (b) being substantially waterproof and having a substantially higher viscosity after step (3).

4,419,157
PROCESS AND APPARATUS FOR MANUFACTURING TELECOMMUNICATION CABLES FILLED WITH EXPANSIBLE POWDER

Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

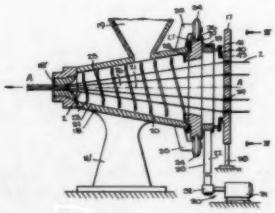
Continuation of Ser. No. 149,467, May 13, 1980, abandoned. This application Sep. 8, 1981, Ser. No. 300,263
Int. Cl.³ H01B *13/06*
U.S. Cl. 156—56 **13 Claims**

1. A process for manufacturing a multi-conductor, electric cable comprising a plurality of conductors bundled together, a covering over the bundled conductors, and a material expansible by the absorption of a liquid disposed between the conductors and between the conductors and the covering, said process comprising:

advancing a plurality of said conductors through a frusto-conical casing having guiding means forming a first wall at the larger diameter end and an inner frusto-conical wall, said casing having a conductor entrance in the first wall at the larger diameter end of said frusto-conical wall and a conductor exit at the smaller diameter end of said frusto-conical wall, said conductors being advanced in the direction from said entrance to said exit, being fed into said entrance in spaced relation and being maintained in spaced relation until they are brought together in converging relation at said exit whereby the conductors effectively form an open frusto-conical cage within said casing having its larger end at said entrance and its smaller end at said exit;

at a point spaced from said exit in the direction of said entrance, supplying said material in powder form to the interior of said frusto-conical wall of said casing and to the interior of said frusto-conical cage while the conductors are advanced, and within said frusto-conical wall, mechanically causing said material in powder form to flow from said point along a helicoidal course within said frusto-conical wall and in said direction in which said conductors are advanced independently of the movement of the conductors, said conductors being exposed within said frusto-conical wall to said powder supplied therewithin and said helicoidal course also being directed so as to intersect the spaced conductors within said frusto-conical wall and so as to pass between the spaced conductors within said frusto-conical wall whereby said material is directed onto and between said conductors within said frusto-conical wall and enters and fills the frusto-conical cage formed by the spaced conductors and advances therewithin and toward said exit at which the material is forced toward the axis of said casing and further penetrates between the conductors; and

when the conductors with the powder thereon and therebetween leave said exit, applying a covering thereover.



4. Apparatus for manufacturing a multi-conductor, electric cable comprising a plurality of conductors bundled together with a material expansible by absorption of liquid disposed on and between the bundled conductors, said apparatus comprising:

a frusto-conical casing having a larger diameter entrance end, a smaller diameter, exit end and a frusto-conical inner wall, a conductor entrance opening at the larger diameter end of said wall and a conductor exit opening, smaller than the entrance opening, at the smaller diameter end of said wall;

means for advancing said conductors through the cavity defined by said wall in the direction from said entrance opening to said exit opening;

guiding means for guiding said conductors in spaced relation at the entrance end of the casing for maintaining the conductors in spaced relation until they are at the exit end of the casing and for bringing the conductors into close relation at the exit end of the casing, where said conductors effectively form a frusto-conical cage within the casing having its larger end at said entrance end and its smaller end at said exit end; and

means for supplying said expansible material in powder form to the interior of said casing at a point spaced from said exit end in the direction of said entrance end and onto and between the spaced conductors within said casing, said casing being free of obstructions between said last-mentioned means and said conductors within said casing

which would prevent said material in powder form from impinging upon said conductors within said casing and from passing therebetween into the cage formed within said casing by said conductors and said last-mentioned means including means within said frusto-conical inner wall of said casing for causing said expansible material in powder form to flow along a helicoical course within said frusto-conical wall from in advance of said exit opening and toward said exit opening, said helicoidal course also intersecting said conductors and passing therebetween.

4,419,158

PROCESS AND APPARATUS FOR THE PRODUCTION OF A PIPE OF FOAM MATERIAL WITH A CLOSURE

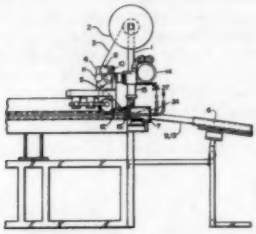
Gerhard Osterhagen, Eitorf, and Siegfried Feige, Siegburg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,879

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140388

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—66 **10 Claims**



1. A process for the continuous manufacture of a pipe that has a slot extending in the longitudinal direction of the pipe and a releasable closure means for closing the slot, and that is made from a sheet of a thermoplastic foam material, which comprises shaping the sheet in the heated thermoelastic and/or thermoplastic state at right angles to its longitudinal direction into form of a pipe, having a longitudinally extending open slot, and bonding strips of the closure means comprised of a thermoplastic synthetic resin, to the mutually facing longitudinal edges of the sheet that define the slot by welding, heat sealing, cementing, or the like bonding procedure; the closure means, prior to being bonded to the shaped, still heated foam pipe, being elongated by the effect of a tensile force to the same extent as the foam pipe shrinks during cooling after application of the closure means, so that the joined together closure means and the foam pipe shrink by the same extent.

4,419,159

MANUFACTURE OF PLASTIC BAGS WITH INTERLOCKING PROFILE EXTRUSIONS

F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 365,814, Apr. 5, 1982, Pat. No. 4,392,897. This application Oct. 12, 1982, Ser. No. 433,614

Int. Cl.³ B29C *24/00*; B65D *33/24*

U.S. Cl. 156—66 **6 Claims**

1. Apparatus for attaching locking profile extrusions to a plastic film comprising:

means for moving a web of said film;

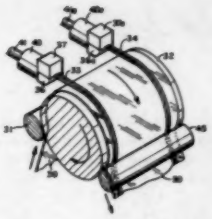
an extruding assembly positioned adjacent to said moving web comprising first and second means for extruding first and second locking plastic profiles and means for supplying molten thermoplastic to said extruding assembly;

means for maintaining the temperature of said moving web sufficiently high so that said profiles adhere to said moving web upon contacting and thereafter cool to set said thermoplastic in said profiles; and

means for maintaining said moving web under tension about a cylindrical roller including a first nip roller for biasing said moving web against said cylindrical roller prior to said moving web coming into contact with said profiles and a second nip roller for biasing said moving web against said cylindrical roller after said profiles come into contact with said moving web, so that contraction of said film upon release compensates for the contraction of said profiles as said profiles cool to prevent puckering of said moving web.

4. A method of attaching locking profile extrusions to a plastic film comprising:

moving a web of said film past an extruding assembly;



extruding from said extruding assembly first and second locking plastic profiles of molten thermoplastic onto said moving web;

maintaining the temperature of said moving web sufficiently high so that said profiles adhere to said moving web upon contacting and thereafter cool to set said thermoplastic in said profiles; and

maintaining said moving web under tension about a cylindrical roller with a first nip roller for biasing said moving web against said cylindrical roller prior to said moving web coming into contact with said profiles and with a second nip roller for biasing said moving web against said cylindrical roller after said profiles come into contact with said moving web, so that contraction of said film upon release compensates for the contraction of said profiles as said profiles cool to prevent puckering of said moving web.

4,419,160

ULTRASONIC DYEING OF THERMOPLASTIC NON-WOVEN FABRIC

Kenneth Y. Wang, and Bobby L. McConnell, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 15, 1982, Ser. No. 339,734

Int. Cl.³ B23K *27/08*; B32B *31/20*

U.S. Cl. 156—73.2 **11 Claims**

1. A process of producing and dyeing non-woven fabric of ultrasonically fusible fibers with an ultrasonic welding machine having horn means and opposed anvil means, the steps comprising:

forming a web of random, loose, ultrasonically fusible fibers;

distributing a fluent dye directly onto the web; and

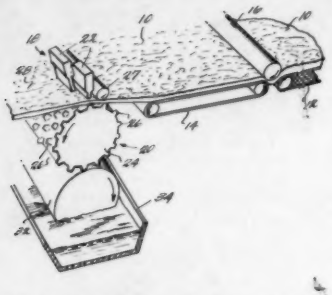
advancing the web with the dye thereon between the horn means and anvil means of the ultrasonic welding machine to utilize the ultrasonic energy thereof to simultaneously bond the fibers in the web at their contacting crossing points to form non-woven fabric and drive the dye into the bond points and fix the dye therein.

10. Apparatus for producing and dyeing non-woven fabric of ultrasonically fusible fibers comprising:

an ultrasonic welding machine having horn means and opposed anvil means, said anvil means comprising a roll having a pattern of anvil points;

means for advancing a web of random, loose ultrasonically fusible fibers between said horn means and said anvil means; and

means for distributing a fluent dye directly onto the web so that at least those contacting crossing points of the fiber



fused and bonded by the ultrasonic energy of the machine are coated with the dye at the time of the application of the ultrasonic energy thereto and the dye is driven into and fixed in said bond points, said distributing means comprising the tops of said anvil points and a kiss roll for applying the dye to said tops.

4,419,161

METHOD OF PRODUCING COMPOSITE CERAMIC ARTICLES

Laurence N. Hailey, Niagara Falls, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 218,982, Dec. 22, 1980, abandoned. This application Dec. 18, 1981, Ser. No. 332,080

Int. Cl.³ B32B *31/00;* **C04B** *39/12*

U.S. Cl. 156—89 **16 Claims**

1. A method of joining separate silicon carbide components to form a composite article comprising the steps of:

(a) coating the face of at least one of the components to be joined with molybdenum boride having the formula Mo_2B_5,

(b) pressing the surfaces to be joined together, and

(c) firing to produce a composite sintered article.

4,419,162

VINYL REPAIR COMPOSITION AND METHOD

Theodore E. Fischer, Birmingham, Ala., assignor to Polyplex Plastics, Inc., Rochester, N.Y.

Filed Sep. 8, 1981, Ser. No. 299,814

Int. Cl.³ B29H *19/00;* **B32B** *35/00*

U.S. Cl. 156—94 **6 Claims**

1. A vinyl repair composition comprising a copolymer of vinyl chloride and vinyl acetate having a molecular weight of about 35,000; a solvent comprising tetrahydrofuran and dimethylformamide in an amount selected to provide a viscous flowable composition; and an amount of water selected to cause the composition, when dried, to release from adhesive tape.

6. The composition of claim 1 comprising the following ingredients in the indicated relative amounts:

Vinyl Chloride: 90 Parts
Vinyl Acetate: 10 Parts
Tetrahydrofuran: 250 Parts
Dimethylformamide: 48 Parts
Dioctylphthalate: 40 Parts
Water: 3.3 Parts.

4,419,163

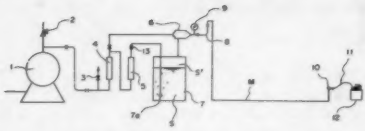
PIPELINE COATING METHOD

Mitsuo Yamamoto, Osaka; Takeo Namazugoshi, Shiga, and Hiroyoshi Seto, Takatsuki, all of Japan, assignors to Osaka Gas, Ltd., Osaka, Japan

Filed Sep. 30, 1981, Ser. No. 307,333

Int. Cl.³ B05D *7/22;* **B32B** *1/08*

U.S. Cl. 156—94 **6 Claims**



1. A method for coating an inner surface of an elongated pipe comprising the steps of supplying a foamed sealant cylindrically along the inner surface of said pipe, directing a compressed air flow centrally of said foamed sealant to drive said sealant along the inner surface of said pipe wherein said sealant sticks to said inner surface over an entire length thereof while flowing in an annular condition along said inner surface of said pipe, and allowing said sealant to cure on the inner surface of said pipe with any excess foam forced from said pipe by said compressed air.

4,419,164

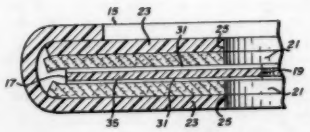
METHOD FOR MAKING A SELF-LUBRICATING LINER

Lawrence G. Martinelli, San Jose, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Division of Ser. No. 155,434, Jun. 2, 1980, Pat. No. 4,354,213. This application Jul. 1, 1982, Ser. No. 394,406

Int. Cl.³ B29D *7/02;* **G11B** *5/016, 23/02, 5/72*

U.S. Cl. 156—244.11 **2 Claims**



1. An improved method for manufacturing a lubricated liner for a floppy disk assembly of the type wherein the assembly includes a disk provided with a magnetic coating including a lubricant compounded therein, the improvement comprising the steps of:

infusing a lubricant, identical to the lubricant compounded into the magnetic coating of the disk, into a precursor material;

extruding fibers from the lubricant-infused precursor material; and

binding the extruded fibers together to form a fibrous liner for abutting against the coating surface of the disk;

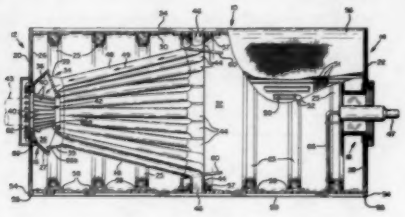
wherein said lubricant infused into said precursor material is of a quantity sufficient to produce the result that, for the finished floppy disk assembly, migration of lubricant from said disk to said fibrous liner is substantially less than if said lubricant were not infused into said precursor material.

4,419,165

METHOD OF MAKING A ROTARY DRUM FILTER AND METHOD OF MAKING AN ANNULAR VALVE HOUSING FOR SUCH A DRUM FILTER

Richard W. LaValley, Vancouver, Wash., assignor to LaValley Industrial Plastics, Inc., Vancouver, Wash.

Division of Ser. No. 231,236, Feb. 4, 1981, Pat. No. 4,383,877.
This application Sep. 29, 1982, Ser. No. 426,919
Int. Cl.³ B32B 31/12
U.S. Cl. 156—245 22 Claims



1. A method of making a rotary drum filter of the type having a valve housing, interior bucket sections for collecting filtrate from the surface of the drum filter, and internal drainage conduits which each deliver filtrate from an associated bucket to a filtrate inlet or chamber of the valve housing upon the application of a vacuum to the chamber in response to a valve member positioned within the valve housing, comprising:

providing a cylindrical plastic filter drum shell with a drive head assembly at least partially of metal at a first or head end of the shell;

mounting a plastic annular valve housing to the drive head;

securing interior plastic bucket sections to the shell;

mounting a tail assembly at least partially of metal to the second or tail end of the shell;

connecting plastic drainage conduits to their associated buckets and filtrate inlets;

providing bucket openings communicating between the exterior of the shell and buckets; and

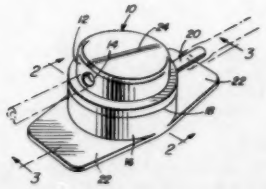
applying a layer of plastic to the metal surfaces of the head and tail assemblies which are within the drum.

4,419,166

METHOD OF ASSEMBLING A FILTER HOLDER

Roger R. Larson, Champaign, Ill., assignor to I-Temp Corporation, Decatur, Ill.

Division of Ser. No. 925,630, Jul. 6, 1978, Pat. No. 4,191,654.
This application Oct. 1, 1979, Ser. No. 80,945
Int. Cl.³ B01D 25/04
U.S. Cl. 156—272.4 3 Claims



1. A method of assembling a membrane filter holder having a filter assembly and enclosing means, the filter assembly comprising a membrane constructed of flat plastic sheet material, said membrane having a flat upper surface and a flat lower surface, substantially all of said lower surface contacting a flat porous metal support plate, and the enclosing means comprising an upper enclosure and a lower enclosure, said enclosures having opposed central recess portions and opposed sealing portions completely surrounding said central recessed portions, the upper closure having a shelf about the inside edge of said recessed portion and having an inlet aperture, said lower enclosure having an outlet aperture, said method comprising the steps of:

(a) aligning said upper enclosure and said lower enclosure on opposite sides of said filter assembly with an edge strip of the upper flat surface of said membrane contacting said shelf and said opposed sealing portions contacting each other and the periphery of said support plate;

(b) heating said metal support plate by induction heating, thereby heating said membrane to a temperature sufficient to melt said upper enclosure at said shelf; and

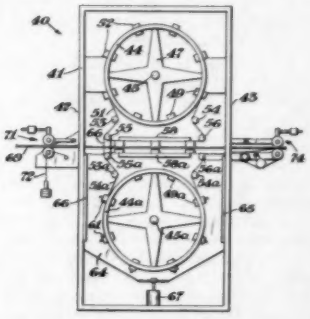
(c) maintaining contact between said shelf and said edge strip until said edge strip is sealed continuously to said shelf, wherein said induction heating further raises the temperature of said metal support plate above the melting temperature of said opposed sealing portions, thereby causing said upper enclosure and said lower enclosure to form a fused seal at the contact point of said sealing portions adjacent said metal support plate.

4,419,167

HEAT SEALING APPARATUS AND METHOD

Robert A. Hay, II, Midland, and Oswald Bergman, Freeland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1982, Ser. No. 376,986
Int. Cl.³ B30B 5/06, 15/34
U.S. Cl. 156—290 7 Claims



1. A heat sealing apparatus, the heat sealing apparatus comprising a frame, the frame supporting a first heating drum rotatably supported thereon and a second heating drum rotatably supported thereon; the first and second heating drums having generally parallel axes the first heating drum having associated therewith a first sealing chain, the first sealing chain comprising a plurality of flexibly connected, transversely extending profiled sealing members; the second heating drum having associated therewith and driven thereby a similar chain and a plurality of sealing elements; the first chain in a region generally adjacent the second drum having at least two rotatable chain support elements disposed in a plane generally parallel to the axes of the first and second heating drums, the plane being generally normal to a plane containing said axes; a second pair of rotatable chain support elements generally parallel to said first chain support elements supporting the second chain; said first and second pair of support elements positioned such that the heat sealing elements of the first and second chains disposed in the region between the first and second pair of chain supporting elements brings the sealing members of the first and second chains into a heat sealing

position; and means to synchronously rotate the first and second heating drums.

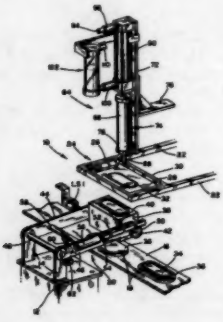
7. A method for the continuous heat sealing of synthetic resinous thermoplastic film comprising providing a first set of a plurality of heat sealing elements, providing a second set of a plurality of heat sealing elements, continuously moving the first and second sets of heat sealing elements to provide intermittent positioning of members of the first and second sets of heat sealing elements in heat sealing relationship to each other, while providing heat to the heat sealing elements by conduction at a location remote from the heat sealing elements when the heat sealing elements are disposed in heat sealing relationship.

4,419,168

APPARATUS FOR HANDLING GASKET-FORMING MATERIAL

William A. Paul, 2338 Townley Rd., Toledo, Ohio 43614

Division of Ser. No. 107,548, Dec. 27, 1979, Pat. No. 4,334,636.
This application Oct. 13, 1981, Ser. No. 310,806
The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—351 **7 Claims**



1. Apparatus for shaping gasket-forming material to a gasket configuration and applying the shaped material to a workpiece, said apparatus comprising shaping means for shaping the gasket-forming material to a desired gasket configuration, and transfer means for transferring the shaped material in operating cycles from said shaping means to a workpiece and returning to said shaping means, means for supplying the gasket-forming material to said shaping means comprising a cartridge of gasket-forming material, a cartridge holder having an opening to receive the cartridge, a plunger at an upper end of said cartridge holder and having a plunger rod extending outwardly therefrom, drive means for engaging said plunger rod to move said plunger toward a lower end of said cartridge holder, means for operating said drive means at predetermined intervals which are multiples of the operating cycles of said transfer means, and means for controlling the length of operation of said drive means at each interval.

4,419,169

APPARATUS FOR RADIANT HEAT SEALING OF BALLOON ONTO CATHETER SHAFT

Lawrence F. Becker, Chicago, and Richard W. Cobean, Libertyville, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

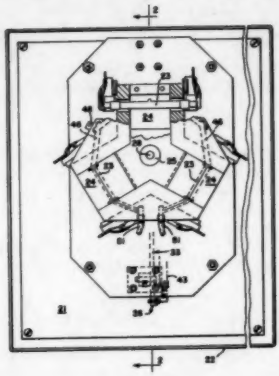
Division of Ser. No. 195,328, Oct. 9, 1980, abandoned, which is a division of Ser. No. 956,590, Nov. 1, 1978, Pat. No. 4,251,305.
This application Mar. 23, 1982, Ser. No. 360,947
Int. Cl.³ H05B *1/00*
U.S. Cl. 156—359 **3 Claims**

1. An apparatus using radiant energy for sealing the annular ends of a tubular member onto an elongated shaft of a medical device, comprising:

an enclosure having a shaft receiving passageway with a cylindrical treatment site therein, said cylindrical treatment site having a band of radiant energy thereat for sealing the annular ends of the tubular member to the shaft;

a plurality of lamps and reflectors for developing and focusing radiant energy into said band of radiant energy at said treatment site; and,

a shaft depth indexing means for aligning portions of an unfinished shaft of a medical device with said cylindrical treatment site, said shaft portions overlapping both a tubular member and a length of the elongated shaft, each of said portions including at least a part of a length of



shrink tubing overlying at least a part of both the shaft and the tubular member, said shaft depth indexing means including a top switch, a bottom switch, an upper stop means for aligning a first of said shaft portions at said cylindrical treatment site, a lower stop means for aligning a second of said shaft portions at said cylindrical treatment site, a biased linkage means for urging said tops which toward engagement with a head end of the elongated shaft, a timer activated by said top switch for transmitting power to said lamps for a predetermined length of time, a solenoid for withdrawing said upper stop and for permitting said elongated shaft to move to said lower stop and activate said bottom switch, a timer activated by said bottom switch for transmitting power to said lamps for a predetermined length of time.

4,419,170

AUTOMATED LAY-UP MACHINE

Leiv H. Blad, Van Nuys, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed May 27, 1982, Ser. No. 382,497
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—361 **12 Claims**

1. A lay-up machine for laying up material comprising:

supply means for supplying said material;

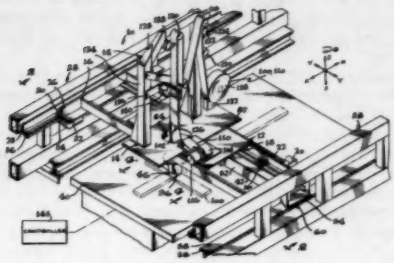
upper carriage means adapted to carry said supply means and having a selected number of degrees of freedom of movement to allow positioning of said supply means;

means for moving said upper carriage means;

laying means adapted to receive said material from said supply means;

lower carriage means adapted to carry said laying means and

having a selected number of degrees of freedom of movement to control the position of said laying means;
means for moving said lower carriage means; and



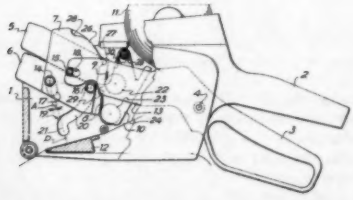
means for slaving the motion of said upper carriage means to the motion of said lower carriage means.

4,419,171

PORTABLE LABELING MACHINE

Werner Becker, Hirschhorn; Heinz Kistner, Neckarsteinach, and Kurt Schrotz, Beerfelden, all of Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Apr. 28, 1982, Ser. No. 372,650
Claims priority, application Switzerland, May 13, 1981, 3098/81
Int. Cl.³ B65C *11/02*
U.S. Cl. 156—384 **10 Claims**



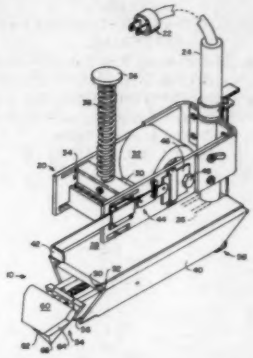
1. A portable labeling machine having a housing (1) provided with a handle (2) with actuating trigger (3) and comprising at least two rocking printheads (5, 6) for printing at least two lines of characters of different colors on self-adhesive labels borne by a continuous support strip, a drive lever (13) connected to the trigger and to the printheads in order to move the latter, guide slides rigidly secured to the housing to guide the rocking of the printheads from a raised inking position to a lowered printing position, a print platen (12) rigidly connected to the housing, and at least two inking rollers (22, 23) of different colors disposed in the path of the lines of characters of the printheads in the raised position of the latter, characterized by the fact that the two printheads (5, 6) are mounted and fixed side by side in a common rocking housing (7) having, on at least one of its two side-walls, a pivot (14), a drive finger (15) and a guide finger (16), the three being spaced apart from each other in the order indicated; by the fact that the pivot is engaged in a first slot (17) which is linear and directed towards the print platen; by the fact that the drive finger is arranged continuously bearing against the drive lever; by the fact that the guide finger is engaged in a second slot (19) having an upper portion (20) in the form of a circular arc centered on the upper portion of the first slot, viewed with reference to the print platen, and a linear lower portion (21) which is also directed towards the print platen; by the fact that the two inking rollers (22, 23) are mounted side by side in a position corresponding to that of the two lines of characters; and by the fact that at least that one of the two rollers which is located on the passage of said two lines of characters is mounted in a retractable movable supprt (24) which is actuated by a retraction mechanism (26,29,30)(15,45,46) controlled by the swiveling of the rocking housing (7).

4,419,172

ADAPTER FOR AUTOMATIC TAPE LAYING MACHINE

John H. Bopst, III, 409 Chalfonte Dr., Baltimore, Md. 21228

Continuation-in-part of Ser. No. 307,365, Jan. 1, 1981, Pat. No. 4,373,987. This application Jul. 19, 1982, Ser. No. 399,958
Int. Cl.³ B31F *1/00*; B44C *7/00*; B30B *5/02*
U.S. Cl. 156—461 **11 Claims**



1. In a system for heating and laying tape in a "V" joint formed by intersecting wall panels upon manual advance of said system therealong, the system having a source of flat tape for running tape over a forward end and down and toward the rear end of a "V"-shaped soleplate adapter, the improvement comprising: means including a head for progressively changing the cross-sectional shape of tape from flat to "V"-shape at said forward end, means resiliently mounting and forwardly biasing said means for progressively changing, and means for holding said tape in alignment with said "V"-shaped soleplate adapter at said rear end in preparation for said tape laying.

4,419,173

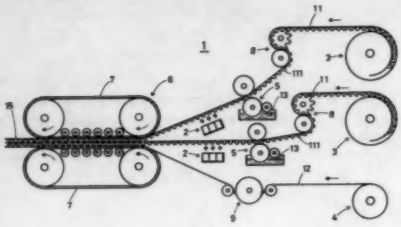
METHOD OF PRODUCING CORRUGATED CARDBOARDS AND APPARATUS

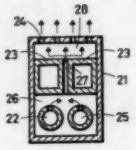
Toshimitsu Akiyama, and Tadashi Kasamatsu, both of Tokyo, Japan, assignors to K-Three Products Kabushiki Kaisha, Tokyo, Japan

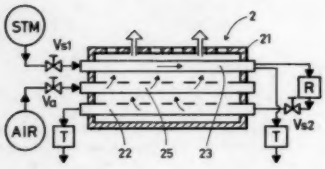
Filed Jul. 22, 1981, Ser. No. 285,804
Claims priority, application Japan, Jul. 22, 1980, 55/100088
Int. Cl.³ B31F *1/20*
U.S. Cl. 156—470 **6 Claims**

1. In an apparatus for producing corrugated cardboards essentially comprising means for continuously feeding at least one half-lined corrugated paper and one liner, means for coating projecting portions of the corrugated paper with a water-suspension of raw starch, means for blowing steam on the coated raw starch suspension to cause gellation thereof, means for applying pressure to the half-lined corrugated paper sheet and the liner so as to adhere them to form a corrugated cardboard, and means for continuously receiving the thus formed corrugated cardboard, an improvement characterized in that the means for blowing steam comprises a pipe for feeding low pressure steam, a tubular body lying near the half-lined corrugated paper sheet across the moving direction of the sheet, the tubular body having multiple nozzles for blowing reheated steam at the upper surfaces of the sheet, a reheater of the feed

steam being located inside the tubular body and having pipes as passages for high pressure steam, the pipes dividing the tubular body into an upper header and a lower mixing chamber, the







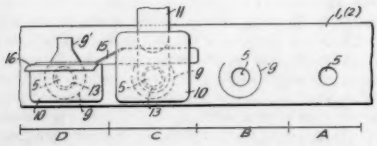
pipe for the low pressure steam and a pipe for air to be mixed with the low pressure steam being positioned in the lower mixing chamber, and a pathway for the mixture connecting the lower mixing chamber and the upper header.

4,419,174

APPARATUS FOR MANUFACTURING OSTOMY POUCHES

Ole R. Jensen, River Vale, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 286,495, Jul. 24, 1981, Pat. No. 4,388,135. This application Feb. 28, 1983, Ser. No. 470,887
Claims priority, application Denmark, Aug. 1, 1980, 3328/80
Int. Cl.³ B32B *31/18, 31/20*
U.S. Cl. 156—513 **2 Claims**



1. An apparatus for manufacturing ostomy pouches having an adhesive label or faceplate that attaches the pouch to the body comprising

(a) means for advancing two superposed webs of weldable plastics sheet material to a preliminary station wherein means are provided for producing an aperture only in the uppermost web;

(b) means for advancing said webs to a first station wherein means are provided to weld said two webs to form a partial pouch contour extending from the top edge of the pouch past the area of said aperture in said uppermost web;

(c) means for advancing said partially contour welded pouch to a second station wherein means are provided to sequentially insert a separator element into said partially contour welded pouch to function as a base for said uppermost pouch wall, to weld an adhesive label or faceplate to said supported uppermost pouch wall around said aperture, and to withdraw said separator element; and

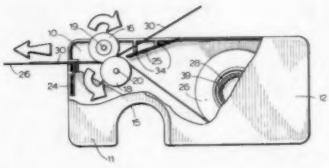
(d) means for advancing said partially contour welded pouch to a third station wherein means are provided to complete the contour welding of said pouch walls and form a completed pouch of desired configuration.

4,419,175

LAMINATING DEVICE FOR LETTERED TAPE

Franklin C. Bradshaw, Scottsdale, Ariz., and Thomas P. Connoy, Lino Lakes, Minn., assignors to Kroy Inc., St. Paul, Minn.

Filed Mar. 29, 1982, Ser. No. 363,015
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—554 **17 Claims**



1. A hand-held device for laminating a piece of adhesive coated laminating tape onto a section of lettered tape or the like of substantially the same width comprising:

a housing having a pair of side walls and top, bottom, front and rear edges;

a first generally cylindrical roller rotatably mounted between said pair of side walls about a first fixed axis generally perpendicular to said side walls, said first roller having a portion extending above the top edge of said housing to permit manual rotation thereof and having a first cylindrical surface parallel to said first fixed axis;

a second generally cylindrical roller rotatably mounted between said pair of side walls about a second fixed axis generally perpendicular to said side walls, said second roller being positioned adjacent said first roller to define a laminating station therebetween and having a second cylindrical surface parallel to said second fixed axis, one of said first and second rollers further having a tape alignment edge extending outwardly from each end of its corresponding cylindrical surface for guiding said laminating tape and said lettered tape in laminating association with said laminating station;

a supply of adhesive coated tape rotatably mounted between said pair of side walls about an axis generally perpendicular to said side walls and rearwardly of said first and second rollers, said supply of adhesive backed tape being disposed so that said adhesive coated tape is supplied to said laminating station between said first and second rollers with the adhesive side of said adhesive coated tape facing upwardly;

guide means for guiding a section of lettering tape from said top edge toward said laminating station; and

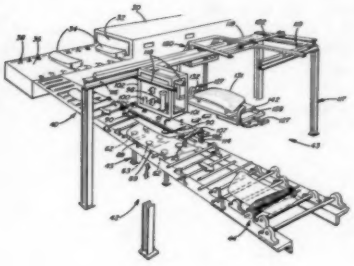
means positioned forward of said first and second rollers for severing said adhesive coated tape.

4,419,176

APPARATUS COMPRISING ARRANGEMENT OF VACUUM CUPS TO ASSEMBLE ONE OR MORE BENT GLASS SHEETS WITH A SHEET OF FLEXIBLE INTERLAYER MATERIAL

James L. Valimont, and Joseph D. Kelly, both of Cheswick, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 287,600, Jul. 28, 1981, Pat. No. 4,368,037. This application Sep. 15, 1982, Ser. No. 418,323
Int. Cl.³ B32B *17/00*; B65H *29/24*
U.S. Cl. 156—556 10 Claims



6. Apparatus for assembling a sandwich comprising a bent glass sheet having a convex major surface and a concave major surface and a flexible sheet of interlayer material assembled in engagement with said concave major surface,

said apparatus comprising an assembly station, a vacuum mold having an apertured wall conforming to the shape of said bent glass sheet,

a mold loading station for engaging said flexible sheet against said apertured wall,

means for moving said mold between said mold loading station and a position of predetermined alignment with said bent glass sheet at said assembly station,

means for moving said mold with said flexible sheet engaging said apertured wall into engagement with said concave major surface of said bent glass sheet,

a first set of spaced vacuum cups adapted to engage the convex major surface of said bent glass sheet and constructed and arranged for movement transverse to said convex major surface of said bent glass sheet,

said first set of vacuum cups being mounted along a curved surface conforming generally to the shape of said bent glass sheet,

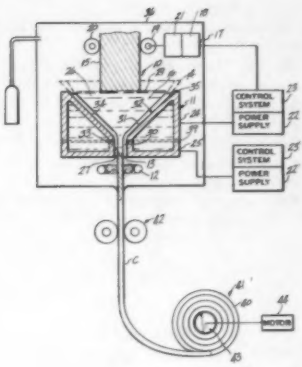
characterized by means biasing at least one vacuum cup in the central portion only of said first set of vacuum cups for limited movement transverse to said curved surface to bias said glass sheet in its central portion facing said biased vacuum cup when said mold moves with said flexible sheet of interlayer material toward said bent glass sheet.

4,419,177

PROCESS FOR ELECTROMAGNETICALLY CASTING OR REFORMING STRIP MATERIALS

Michael J. Pryor, Woodbridge; Derek E. Tyler, Cheshire, and John C. Yarwood, Madison, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sep. 29, 1980, Ser. No. 191,630
Int. Cl.³ B22D *11/16, 27/02*
U.S. Cl. 156—601 11 Claims



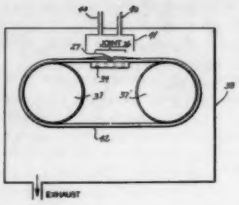
1. In a process for electromagnetically containing and forming molten material into a desired thin strip shape comprising the steps of providing at least two inductors for applying a magnetic field to said molten material wherein a first of said inductors elecromagnetically contains a first portion of said molten material and a second of said inductors electromagnetically contains and forms a second portion of said molten material into said thin strip shape at a solidification zone, powering said inductors to provide said magnetic field, and electromagnetically containing and forming said molten material, the improvement comprising: controlling the heat input to said first portion and said second portion of said molten material and stirring said molten material in said first portion so that the molten material in said first portion is at a lower temperature than the molten material in said second portion at said solidification zone, said heat input controlling and stirring steps comprising the step of powering said first inductor with an alternating current having a first frequency and powering said second inductor with an alternating current having a second frequency substantially higher than said first frequency, whereby beneficial cooling of the molten material at said solidification zone is provided by the molten material of said first portion and the overall power consumption of said process is reduced.

4,419,178

CONTINUOUS RIBBON EPITAXY

Daniel L. Rode, 9 Prado, St. Louis, Mo. 63124

Filed Jun. 19, 1981, Ser. No. 275,321
Int. Cl.³ C30B *29/60*
U.S. Cl. 156—610 **10 Claims**



2. A process for forming an endless belt of monocrystalline composition comprising the steps of:

(a) slicing from a boule of said first monocrystalline composition a flat strip of uniform thickness;

(b) beveling ends of said strip to provide beveled end surfaces each of preselected crystallographic orientation;

(c) bending the opposite ends of said strip back upon each other in end-to-end juxtaposed relationship to define a bevel-edged notch between the ends of said strip, said bending being at a local radius not less than a local critical minimum radius; and

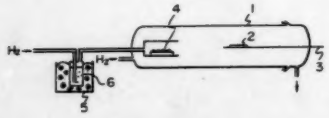
(d) epitaxially growing material of said monocrystalline composition on said beveled end surfaces to fill said notch, thereby to provide said endless belt.

4,419,179

METHOD OF VAPOR PHASE GROWTH

Masaharu Nogami, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 20, 1981, Ser. No. 245,668
Claims priority, application Japan, Mar. 31, 1980, 55-41740
Int. Cl.³ C30B *25/10*
U.S. Cl. 156—613 **5 Claims**



1. A method of vapor phase epitaxial growth of gallium arsenide (GaAs) under kinetically limited growth conditions comprising the steps of: placing a substrate monocrystal in a uniform temperature region where a growth temperature T_D (K) is maintained at a level of approximately 650° to 700° C. and growing GaAs in said uniform temperature region while maintaining the molar fraction (MF) of arsenic in a feed gas within a range of $2.6\times10^{11}\exp(-3.1\times10^{4}/T_D)>MF>1.5\times10^{-17}\exp(-4.5\times10^{4}/T_D)$.

4,419,180

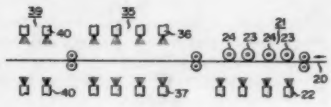
Patent Not Issued For This Number

4,419,181

METHOD FOR ETCHING METALLIC SHEET

Hiroshi Tanaka, and Fusao Sakata, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 248,795, Mar. 30, 1981, Pat. No. 4,357,196. This application Aug. 19, 1982, Ser. No. 409,350
Claims priority, application Japan, Apr. 2, 1980, 55-41957
Int. Cl.³ C23F *1/02*
U.S. Cl. 156—640 **4 Claims**



1. A method for etching a metallic sheet comprising:

a first step of forming an anticorrosive pattern defining apertures on one surface of the metallic sheet and an anticorrosive pattern defining smaller apertures than said apertures on the other surface of said sheet;

a second step of lightly etching said the other surface for removing an oxide film on the surface of the metal to expose the surface of the metal;

a third step of spraying an etching solution on said one surface for etching said one surface to a predetermined depth; and

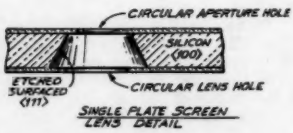
a fourth step of simultaneously spraying an etching solution on both surfaces of said metallic sheet for forming apertures in said metallic sheet.

4,419,182

METHOD OF FABRICATING SCREEN LENS ARRAY PLATES

Eugene R. Westerberg, assignor to Veeco Instruments Inc., Melville, N.Y.

Filed Feb. 27, 1981, Ser. No. 239,066
Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—644 **4 Claims**



1. A method of fabricating screen lens array plates from round, silicon wafers of about 0.5 mm thickness comprising the steps of:

(a) polishing both sides of a silicon wafer;

(b) oxidizing both sides of the silicon wafer to produce a high density, low porosity oxide coating having a thickness of about 2 microns;

(c) exposing by photolithographic techniques a predetermined pattern on both sides of the silicon wafer;
(d) indiffusing in conjunction with vapor transfer techniques a boron layer into both sides of the wafer to a depth of about 10 microns to a concentration greater than about 7×10^{19} atoms/cm^3; and
(e) anisotropically etching the silicon wafer until said predetermined pattern has been formed through the thickness of the wafer.

4,419,183
ETCHANT
Michael Gulla, Sherborn, and Marc Connelly, Roslindale, both of Mass., assignors to Shipley Company Inc., Newton, Mass.
Filed Jan. 18, 1983, Ser. No. 458,956
Int. Cl.³ C23F 1/00; B44C 1/22
U.S. Cl. 156—666 **20 Claims**

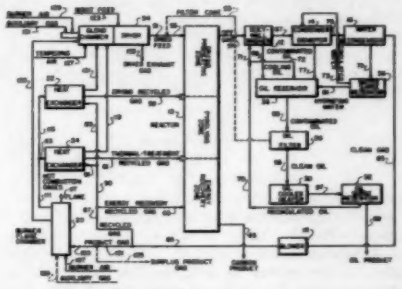
12. A process for preparing a copper surface for metal deposition, said process comprising contact of the surface with an etchant comprising sulfuric acid in an amount of at least 0.5 moles per liter, hydrogen peroxide in an amount of at least 0.1 moles per liter and a solution soluble source of tungsten in an amount of at least 0.00005 moles per liter, said contact being for a time sufficient to form a matte surface over the copper.

4,419,184
METHOD FOR CONTROL OF CHEMICALS DURING GAS TREATMENT OF SUSPENSIONS
Ake Backlund, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden
Filed Jul. 20, 1981, Ser. No. 284,815
Claims priority, application Sweden, Aug. 26, 1980, 8005959
Int. Cl.³ D21C 7/12
U.S. Cl. 162—49 **15 Claims**

1. A method of treating a pulp suspension with a treatment gas comprising the steps of:
(a) adding a quantity of treatment gas to the pulp suspension in the form of finely distributed small bubbles the gas selected from the group consisting essentially of oxygen and oxygen containing gas;
(b) after step (a), determining the density of the suspension containing the treatment gas at at least one moment;
(c) simultaneously measuring the temperature and pressure of the suspension containing the treatment gas corresponding to the density determined during step (b);
(d) calculating the residual gas content of the suspension at the at least one moment at which the density is determined, the calculation utilizing the information determined in steps (b) and (c);
(e) calculating the gas consumption as the difference between the quantity of gas added in step (a) and the residual gas quantity calculated according to step (d);
(f) controlling the quantity of gas added in step (a) based upon the consumption calculation in step (e) to obtain a desired resultant treatment of the suspension; and
wherein steps (b) through (f) are practiced while maintaining the suspension at a substantially contant superatmospheric pressure.

4,419,185
PYROLYSIS SYSTEM WITH HOT GAS RECIRCULATION
Mack D. Bowen, Smyrna, and Kenneth R. Purdy, Decatur, both of Ga., assignors to American Carbons, Inc., Atlanta, Ga.
Filed Jul. 16, 1981, Ser. No. 283,033
Int. Cl.³ C10B 49/06, 53/02
U.S. Cl. 201—4 **27 Claims**

1. In a continuous process for producing a solid carbonaceous residue of predetermined volatile content, a pyrolytic oil, and a gaseous product, from an organic material that self-decomposes at elevated temperatures to a solid carbonaceous residue and a gaseous mixture of condensible and noncondensible fractions, the steps comprising:
(a) establishing a vertically moving packed bed of said material, and maintaining said bed by substantially continuously introducing a feed of said material to the top portion thereof and removing said solid residue from the bottom portion thereof;
(b) determining a maximum temperature, in the range of about 800° to 1400° Fahrenheit, to which said material is to be heated in said bed, corresponding to the desired volatile content of said residue;
(c) establishing a temperature gradient through the depth of said bed, with said maximum temperature being maintained at an intermediate level, for pyrolysis of said material to said residue and gaseous mixture;
(d) withdrawing said gaseous mixture from said top portion of said bed as an offgas stream, including a noncondensible fraction and a condensible fraction comprised of organic vapors and water vapor, and treating said offgas stream to remove substantially all entrained solid particulate and condensible fractions therefrom, to provide a cleansed gas;
(e) recycling and upwardly drafting through said bed a first portion of said cleansed gas for energy recovery, said recovery gas being introduced into said bed at a lower level disposed below said intermediate level thereof, to define an energy recovery zone therebetween, and at a temperature substantially below said maximum tempera-



ture, the volumetric flow rate of said recovery gas and the depth of said energy recovery zone being so maintained that said recovery gas is heated substantially to said maximum temperature at entry to said intermediate bed level, and is at least substantially in thermal equilibrium with said material thereat;
(f) recycling and upwardly drafting through said bed a second portion of said cleansed gas for thermal treatment of said material, said treatment gas being introduced into said bed substantially at said intermediate level and substantially at said maximum temperature; and
(g) recycling and upwardly drafting through said bed a third portion of said cleansed gas for drying and preheating said feed, said drying/preheating gas being introduced at a level above said intermediate level and below the level of feed introduction to define therewith pyrolysis and drying/preheating zones, respectively, and being at a temperature that is substantially the same as that of the upward flowing gases and vapors exiting from said pyrolysis zone, the depth of said pyrolysis zone being so maintained as to ensure adequate pyrolysis of said material, the temperature and volumetric flow rate of said drying/preheating gas and the depth of said drying/preheating zone being so maintained as to adequately dry and preheat said feed material to said self-decomposition point, prior to entry into said pyrolysis zone in cooperation with said recovery gas and said treatment gas, and to therewith maintain said offgas stream at a temperature between the

temperatures at which said recovery and drying/preheating gases are introduced into said bed.

4,419,186

PROCESS FOR MAKING STRONG METALLURGICAL COKE

Fritz O. Wienert, 394 Roosevelt Ave., Niagara Falls, N.Y. 14305

Filed Dec. 11, 1981, Ser. No. 329,717
Int. Cl.³ C10B 47/10, 53/08
U.S. Cl. 201—6 14 Claims

1. A process for making strong metallurgical coke in a slot coke oven which comprises making a charge for said coke oven which shrinks during carbonization by mixing together, in a proportion which will result in the mix becoming transiently plastic during subsequent heating in a coke oven, particles of a fusible bituminous coal or a mixture of such coals of which about a major proportion by weight is of a size or sizes smaller than about 0.15 millimeter, and particles of a non-fusible material or mixture of such materials compatible with a blast furnace burden, of which at least a substantial proportion by weight is of a size smaller than about 0.15 mm., adding water to said mixture in such a proportion that subsequent compacting of such a mixture mixed with the water, at a pressure higher than about 500 kilograms per square centimeter, squeezes out at least 0.1% of water, by weight, based on the weight of the admixed water, mixing together the mixture of fusible bituminous coal particles and non-fusible material particles and the water, compressing such resulting mixture into a compacted product at a pressure higher than 500 kg./sq. cm. and heating the resulting compacted product and any fragments thereof which may be present, in a slot coke oven as at least a part of a charge thereto, so that the charge in such oven becomes transiently plastic and shrinks during such heating, and a strong metallurgical coke results.

4,419,187

APPARATUS AND METHOD FOR THERMAL MEMBRANE DISTILLATION

Dah Y. Cheng, Los Altos, and Steve J. Wiersma, Sunnyvale, both of Calif., assignors to International Power Technology, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 170,897, Jul. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 12,047, Feb. 14, 1979, Pat. No. 4,265,713. This application Mar. 4, 1982, Ser. No. 354,711
Int. Cl.³ B01D 3/02
U.S. Cl. 202—200 5 Claims

1. An improved thermal membrane distillation apparatus for distilling aqueous solutions comprising:

a. a means for providing a body of distilland;

b. a composite membrane having

(1) a microporous lyophobic layer;

(a) selected from the group consisting of polytetrafluoroethylene and polyvinylidene fluoride,

(b) wherein the average pore diameter is less than 0.4 millimicrons; and

(2) wherein the improvement comprises means for preventing liquid intrusion into the pores of the lyophobic layer including a deposited layer of an essentially non-porous lyophilic coating on the lyophobic layer;

(a) the lyophilic coating being selected from the group consisting of polyallylamine, polyacrylic acid and dehydrated polyvinyl alcohol,

(b) wherein the lyophilic coating is positioned adjacent to the distilland; and

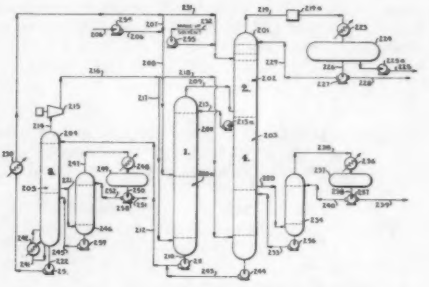
c. a means sized for preventing said liquid intrusion by providing a sufficient temperature gradient across said microporous lyophobic layer so that the liquid distilland evaporates on the distilland of the pores of the lyophobic layer and condenses on the liquid distillate side of the pores of the lyophobic layer.

4,419,188

THERMALLY COUPLED EXTRACTIVE DISTILLATION PROCESS

Thomas F. McCall, 5425 Windsor La., Fairway, Kans. 66205

Continuation of Ser. No. 155,660, Jun. 2, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 350,592
Int. Cl.³ B01D 3/40
U.S. Cl. 203—24 25 Claims



1. In a plurality of distillation columns having positioned therewithin a plurality of distillation zones, the process of thermally coupled, extractive distillation comprising the steps of:

(1) extractively distilling in a first distillation zone a first feed stream containing higher and lower boiling components in the presence of extractive solvent to separate a relatively high volatility overhead vapor stream and a relatively low volatility liquid bottoms stream,

(2) supplying said overhead stream to the lower portion of a second distillation zone and said bottoms stream to the upper portion of a third distillation zone,

(3) passing an overhead vapor stream, after dividing same, from said third distillation zone to a lower level of a fourth distillation zone and a lower level of the first distillation zone,

(4) passing a second feed stream of predominantly extractive solvent to an upper part of the second distillation zone,

(5) passing a liquid stream from the lower portion of the second distillation zone to an upper level of the first distillation zone and also to an upper level of the fourth distillation zone,

(6) passing a liquid stream from the lower portion of the fourth distillation zone to an upper portion of the third distillation zone,

(7) additionally carrying out extractive distillations in said second, third and fourth distillation zones also in the presence of said extractive solvent,

(8) withdrawing an overhead highest volatility vapor stream from the top of the second distillation zone,

(9) withdrawing an intermediate, next lower volatility stream, including some extractive solvent, from said fourth distillation zone intermediate the ends thereof,

(10) withdrawing a lowest volatility liquid bottoms stream, predominantly comprising extractive solvent, from said third distillation zone,

(11) passing at least a portion of the overhead withdrawal stream from the top of the second distillation zone, as well as a portion of the intermediate withdrawal stream from the fourth distillation zone out of the system,

(12) condensing said second distillation zone overhead withdrawal vapor stream and recycling at least a portion thereof as reflux to an upper level of the second distillation zone

(13) heating the lower part of the third distillation zone to aid in accomplishing the distillation of the said four distillation zones, and

(14) recycling at least a portion of the third distillation zone bottoms withdrawal stream, after cooling thereof, to an upper level of the second distillation zone as the major portion of the second, predominantly extractive solvent feed stream thereto.

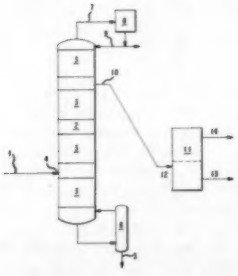
4,419,189
DISTILLATION OF 1,4-BUTANEDIOL

Vincent P. Caracciolo, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jan. 11, 1982, Ser. No. 338,475

Int. Cl.³ B01D *3/06, 3/26;* **C07C** *29/80, 31/20*

U.S. Cl. 203—77 **2 Claims**



1. A continuous two-stage process for refining 1,4-butanediol containing 1-20% by weight of water and 0.05-5% by weight of tars, the process comprising

(a) in the first stage, passing the butanediol to a column at its midpoint or below, subjecting the 1,4-butanediol to vacuum distillation, and withdrawing partially refined liquid butanediol from the column at a point above its entry point,

and

(b) in the second stage, subjecting the butanediol from the first stage to a single-stage flash evaporation under a vacuum greater than that in the column of the first stage, and withdrawing the refined butanediol, which contains less than 400 ppm of water and is substantially free of color-formers, from the evaporation stage as the unvaporized component.

4,419,190
METHOD AND APPARATUS TO MEASURE THE OPERATING TEMPERATURE OF SOLID ELECTROLYTE-TYPE GAS SENSORS

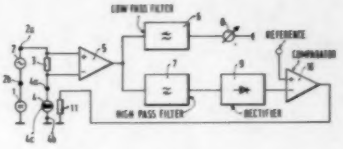
Hermann Dietz, Gerlingen; Ferdinand Grob, Besigheim; Klaus Muller, Tamm; Lothar Raff, Remseck; Franz Rieger, Aalen, and Hans-Martin Wiedenmann, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,803

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117790

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—1 T **9 Claims**



1. Method of measuring the operating temperature of a limit current-type solid electrolyte gas composition sensor (4) having two electrodes (4*a*, 4*b*),

wherein the electrical characteristic of the sensor, representative of combustion of the gas, varies with change of at least a component thereof, and said change is evaluated;

comprising, in accordance with the invention, the steps of

applying to the electrodes of the sensor (4) a direct voltage and, serially therewith, an alternating voltage of a frequency substantially in excess of the rate of variation of said electrical characteristic and of an amplitude which is substantially less than the range of direct voltage within which the current through the sensor is essentially independent of applied direct voltage and depends only on concentration of said gas;

and measuring the magnitude of alternating current flowing through the sensor to obtain a measure of the temperature thereof.

5. Apparatus to determine the operating temperature of a solid electrolyte limit current-type or polarographic-type gas composition sensor (4) having two electrodes (4*a*, 4*b*);

said apparatus including

a d-c current source (1) connected to the electrodes;

means (6, 7) for evaluating an electrical characteristic of the sensor representative of the composition of the gas and varying with change of at least one component thereof,

and comprising

an alternating current voltage source (2) serially connected with the d-c current source and the electrodes of the sensor (4*a*, 4*b*);

current measuring means (3, 5) connected to the sensor and measuring current flow therethrough, the d-c current source (1), the a-c voltage source (2), the current measuring means (3) and the sensor (4) being connected in a closed series circuit, and the a-c voltage from said a-c source (2) being superimposed on, or modulating the d-c voltage; and

frequency separating means (6, 7) connected to the output of said current flow measuring means and separating alternating current components and essentially direct current or slowly varying current components, and deriving, respectively, direct output signals representative of the at least one component in the composition of the gas, and alternating current components representative of temperature of the gas,

the level of a-c voltage applied from the a-c source being of an amplitude which is substantially less than the range of direct voltage within which the current through the sensor is essentially independent of applied direct voltage.

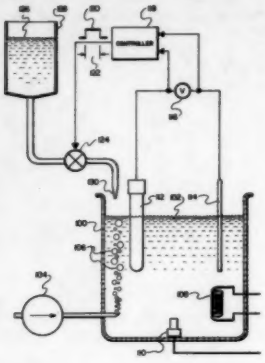
4,419,191
ELECTROCHEMICAL MONITORING METHOD

Kenneth E. Weber, Pacific Palisades, and Steven D. Hoffer, Sunnyvale, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Division of Ser. No. 346,168, Feb. 5, 1982. This application Aug. 20, 1982, Ser. No. 410,184

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—1 T **4 Claims**



1. An electrochemical method for monitoring the concentration of hydrogen peroxide within an alkaline peroxide solution comprising the steps of:

(a) immersing a saturated calomel first electrode into said solution;

(b) immersing a pure metal magnesium second electrode into said solution; and

(c) measuring the electrochemical potential voltage generated between said first and second electrodes.

4,419,192
METHOD FOR GALVANIC DEPOSITION OF COPPER

Wolfgang Dahms, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 17, 1981, Ser. No. 244,727

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3012168

Int. Cl.³ C25D *3/38*

U.S. Cl. 204—15 **7 Claims**

1. Method for galvanic deposition of smooth and ductile copper from acid copper baths, the metal content of which baths remains unchanged during the deposition, comprising the steps of providing an acid copper bath, inserting the object to be plated into said bath, connecting said object as a cathode, immersing into said bath a combination of soluble anode and inert anode composed of precious metal, precious metal alloys or their compounds, connecting said anodes to a source of electrical energy, using the anodes in which the ratio of the geometric surface of inert to soluble anode amounts to from 1:1 to 1:200, and providing the inert anode additionally with a potential.

5. Method according to claim 1 for building up the conductor paths of printed circuits.

4,419,193
METHOD FOR MAKING HOLLOW PENDANTS

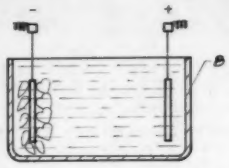
Juei-Lung Chen, Kaohsiung, Taiwan

Filed Aug. 31, 1982, Ser. No. 413,500

Int. Cl.³ C25D *5/34, 7/00*

U.S. Cl. 204—18.1 **2 Claims**

1. A method for making a hollow pendant of copper plate comprising cutting workpieces of the desired configuration for the pendant from copper plate, press-forming said workpieces into half-pieces having the desired form for a half-piece of the pendant, clamping two of said half-pieces tightly together at their common surface to be joined, slowly rotating said



clamped half-pieces and simultaneously welding said surface together with silver alloy welding rod to join said half-pieces into a pendant, grinding said welded joint, polishing said pendant, and electroplating the surface of said pendant with the desired material to make the finished product.

4,419,194
METHOD AND APPARATUS FOR CONTINUOUSLY CHROMIUM-PLATING

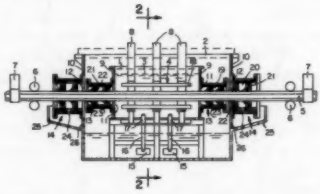
Sergio Angelini, Milan, Italy, assignor to Brevetti Elettrogalvanici Superfiniture S.R.L., Milan, Italy

Filed May 6, 1982, Ser. No. 375,786

Claims priority, application Italy, May 20, 1981, 21843 A/81

Int. Cl.³ C25D *7/00, 17/00*

U.S. Cl. 204—25 **10 Claims**



1. A method for removing hydrogen in continuously chromium-plating of bars and the like, in which the bar is moved forward along a rectilinear path and through an anode immersed in a chromium-plating bath, and in which the level of the fluid in the chromium-plating bath is kept at a constant height by recycling the chromium-plating fluid of the aforesaid bath, the improvement comprising the steps of recycling the fluid of the chromium-plating bath feeding it directly into the space within the chromium-plating anode and directing a jet of chromium-plating fluid under pressure, towards surfaces of the aforesaid bar.

5. An apparatus for the continuously chromium-plating of bars and the like, for carrying out a method for removing hydrogen, the apparatus comprising a first inner tank containing a chromium-plating bath, placed within a second tank outside the first, the tanks having lateral walls with apertures for passage of the bars, said apertures being aligned with an anode having apertures immersed in the chromium-plating bath, and sealing means in correspondence with the apertures in the aforesaid walls, said sealing means comprising chambers for collecting the chromium-plating fluid passing through the seals themselves and means for conveying it into the outer tank and further comprising a cylindrical body for supporting at least two sets of flexible sealing elements axially spaced apart from one another and removably fixed to the wall of the tank, and spacing elements arranged within the aforesaid cylindrical body, the flexible sealing elements being held tight, by the action of an outer thrust flange, between the opposing edges of

two adjacent spacers, said spacers and said supporting body presenting on the bottom thereof outlet apertures for the chromium-plating fluid, and a system for recycling the chromium-plating fluid under pressure, from the outer tank to the inner tank, said recycling system comprising nozzles placed in correspondence with apertures in the anode, facing towards the inside of the anode itself and towards the bar to be chromium-plated.

4,419,195

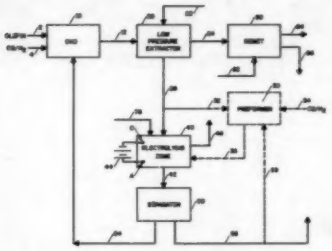
ELECTROLYTIC RECOVERY OF COBALT OXO CATALYSTS

David A. Young, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 7, 1982, Ser. No. 337,593

Int. Cl.³ C25B *3/02*

U.S. Cl. 204—78 **14 Claims**



1. A process for forming dicobalt octacarbonyl in liquid medium, which comprises subjecting an aqueous solution containing a water-soluble tetracarbonylcobaltate salt in an electrolysis zone and in the presence of an organic solvent for dicobalt octacarbonyl to an externally applied voltage and electrical current at a magnitude and for a time sufficient to convert at least a portion of said tetracarbonylcobaltate salt to dicobalt octacarbonyl which is extracted into said organic solvent thereby forming an organic phase containing dissolved dicobalt octacarbonyl which can be recovered and is suitable for use as catalysts feed to an olefin hydroformylation reaction.

4,419,196

PRODUCTION OF MOLDED PRODUCTS BASED UPON A TWO-COMPONENT HYDRAULIC MINERAL RESIN

Philippe J. Beckerick, 44 rue J. Ferry, Follainville, France (78200); Patrice R. Hamelin, 6 rue Chanbfort, Villeurbanne, France (69100), and Andre R. Fumez, Le Bourg d'en Haut, Bons en Chablais, France 74140

Filed Mar. 25, 1981, Ser. No. 247,328

Int. Cl.³ B06B *3/00;* **C04B** *9/02, 70/2*

U.S. Cl. 204—157.1 R **7 Claims**

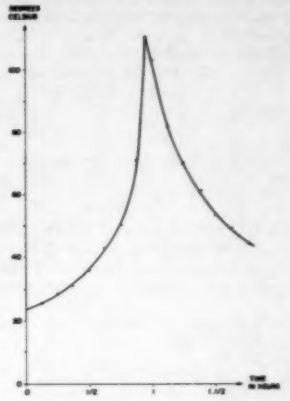
1. Manufacturing process for molded products, whether or not expanded, based upon a two-component mineral resin mixture of magnesium oxide and magnesium chloride and water to form a pourable or moldable binder, said process comprising the steps of:

preparing the hydraulic binder by making a mixture comprising

20 to 30% of magnesium chloride and

70 to 80% of magnesium oxide, to which ingredients there is added a quantity of water of between 10 and 35%; and

subjecting the mixture to mechanical or electromagnetic vibrations, including waves of light or nuclear energy sufficient to trigger an abrupt exothermic reaction within the core of the mixture, which causes the temperature of the mixture to spontaneously rise without continued addition of external heat during the entire setting period, whereby the mixture sets and hardens.



4,419,197

PROCESS FOR CROSS-LINKING OF NON-POLAR POLYMERS IN HIGH FREQUENCY ELECTRIC ALTERNATING FIELDS

Heinz Meyer, Hohenschäftlarn; Maximilian Dorn, Munich, and Hans Seidl, Grünwald, all of Fed. Rep. of Germany, assignors to Peroxide-Chemie GmbH, Höllriegelskreuth Bei München, Fed. Rep. of Germany

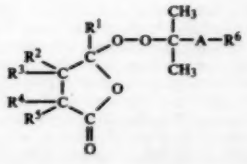
Filed May 4, 1981, Ser. No. 260,481

Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018321

Int. Cl.³ C08F *8/00*

U.S. Cl. 204—159.2 **8 Claims**

1. Process for cross-linking non-polar polymers in a high frequency electric alternating field which comprises contacting the non-polar polymer with a peroxide cross-linking agent and exposing the mixture to a microwave electric alternating field, wherein the cross-linking agent peroxide is of the formula



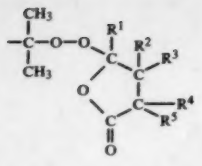
in which

R^1 is a hydrogen atom, an alkyl radical containing up to 4 carbon atoms or a phenyl radical optionally substituted by halogen atoms or alkyl radicals containing up to 4 carbon atoms;

R^2, R^3, R^4 and R^5, which can be the same or different, are hydrogen atoms or, together with the carbon atoms to which they are attached, represent o-phenylene radicals;

A is a straight-chained or branched alkylene radical containing up to 5 carbon atoms or a straight-chained or branched alkylene radical containing up to 5 carbon atoms or a phenylene radical and;

R^6 is a hydrogen atom or a radical of the general formula



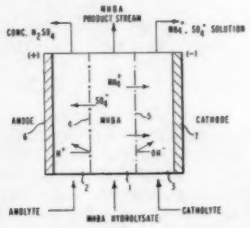
in which R^1, R^2, R^3, R^4 and R^5 are identified as above.

4,419,198

PURIFICATION OF METHIOINE HYDROXY ANALOGUE HYDROLYZATE BY ELECTRODIALYSIS

Ernest J. Breda, Beaumont, Tex., and Kenneth B. Keating, Wilmington, Del., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 22, 1981, Ser. No. 275,670
Int. Cl.[3] B01D *13/02*
U.S. Cl. 204—180 P 8 Claims



1. A process for separating anions and cations from a reaction mixture obtained by acid hydrolysis of MHBN to MHBA comprising:

(i) introducing the reaction mixture into an electrolytic cell, said cell having at least three compartments, an anode compartment containing anolyte and having an anode in contact with said anolyte, a cathode compartment containing catholyte and having a cathode in contact with said catholyte, separated by at least one process compartment into which said reaction mixture is introduced, an anion-exchange membrane separating said anode compartment from said process compartment, and a cation-exchange membrane separating said cathode compartment from said process compartment; said anolyte and said catholyte being selected from water or aqueous sulfuric acid containing up to about 10% sulfuric acid;

(ii) applying a direct current of electricity through the cell such that up to about 450 Ampere-hours of electrical charge are passed per liter of reaction mixture, the current being driven by an applied voltage of about 2 to 20 volts per cell; and

(iii) recovering the purified MHBA reaction mixture.

4,419,199

PROCESS FOR PHOSPHATIZING METALS

Dieter Hauffe, Frankfurt; Gerhard Muller, Hanau; Werner Rausch, Oberursel, and Gudrun Volling, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Occidental Chemical Corporation, Warren, Mich.

Filed Apr. 30, 1982, Ser. No. 373,475
Claims priority, application Fed. Rep. of Germany, May 9, 1981, 3118375
Int. Cl.[3] C23F *7/10, 7/12;* C25D *13/06, 13/20*
U.S. Cl. 204—181 R 6 Claims

1. A process for phosphatizing metal surfaces which comprises forming a phosphate coating on the metal surface by contacting the metal surface with an aqueous acidic zinc phosphate solution containing an oxidizing agent, which zinc phosphate solution contains:

from about 0.4 to 1.5 g/liter of Zn,
from 0 to 1.3 g/liter of Ni and
from 10 to 26 g/liter of P_2O_5,

and in which the weight ratio of Zn to:P_2O_5 is from about 0.012 to 0.12:1 and the weight ratio of Ni to Zn is from about 0 to 1.5:1 and, thereafter, replenishing the said zinc phosphate solution with a replenishing solution in which the weight ratio of Zn:Ni:P_2O_5 is from about 0.18 to 0.33:0 to 0.06:1.

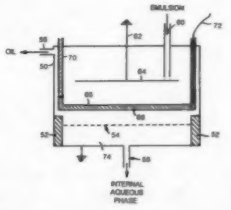
6. The process as claimed in claim 1, 2, 5, 3, or 4 in which, following the formation of the phosphate coating on the metal surfaces treated, an electrophoretic coating is applied to said treated surfaces.

4,419,200

ELECTRICAL COALESCENSE OF LIQUID EMULSIONS

Edward C. Hsu, Bridgewater; Norman N. Li, Edison, and Taras Hucal, Iselin, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 27, 1981, Ser. No. 286,874
Int. Cl.[3] B03C *5/00;* C25B *11/00*
U.S. Cl. 204—186 8 Claims



1. In a process for electrically coalescing a water-in-oil emulsion in an AC electrical field in a coalescing zone between at least two cooperating electrodes wherein a layer of solid dielectric medium is maintained in at least one portion of said inter-electrode field space adjacent to at least one electrode, the improvement which comprises a hydrophobic surface on at least a portion of said dielectric medium at the interface of said dielectric medium and said emulsion in said coalescing zone and wherein the dielectric constant of said dielectric medium is at least about 4.

4,419,201

APPARATUS AND METHOD FOR PLASMA-ASSISTED ETCHING OF WAFERS

Hyman J. Levinstein, and Frederick Vratny, both of Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 24, 1981, Ser. No. 295,531
Int. Cl.[3] C23C *15/00*
U.S. Cl. 204—192 E 8 Claims

1. Apparatus for low-contamination plasma-assisted dry etching of an aluminum layer formed on a wafer, said apparatus comprising

a reaction chamber,

means for establishing within said chamber an etching plasma derived from a mixture of boron trichloride and chlorine gases,

said chamber including surfaces exposed to said plasma,

and a coating of aluminum oxide on at least the surfaces in the immediate vicinity of the wafer to be etched,

wherein said coating comprises individual particles of crystalline-β aluminum oxide fused together on said surfaces in a plasma spraying process.

4,419,202

METAL COATINGS

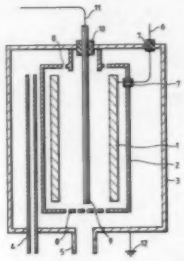
Ian P. Gibson, Snodland, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 17, 1981, Ser. No. 331,881

Claims priority, application United Kingdom, Dec. 22, 1980, 8041039

Int. Cl.³ C23C 15/00

U.S. Cl. 204—192 N 8 Claims



1. A method of coating the inner surface of a gun barrel with a wear resistant material, comprising the steps of:

(i) providing a coating material source within the gun barrel comprising a refractory metal or a refractory metal compound together with another metal, said refractory metal having a melting point in excess of 1535° C.;

(ii) establishing a glow discharge in the region of the source, said source being connected as a sputtering cathode; and

(iii) applying a negative bias potential to the gun barrel;

whereby a smooth tenacious coating having a substantially non-columnar microstructure is formed on the inner surface of the gun barrel without excessive heating thereof.

4,419,203

APPARATUS AND METHOD FOR NEUTRALIZING ION BEAMS

James M. E. Harper; Mordehai Heiblum, both of Yorktown Heights, N.Y., and Harold R. Kaufman, Fort Collins, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1982, Ser. No. 355,067

Int. Cl.³ C23C 15/00

U.S. Cl. 204—192 R 8 Claims

1. An apparatus for generating a self-neutralized ion beam comprising:

a plasma chamber for receiving a gas for producing ions, said chamber including anode and cathode elements, and an acceleration screen grid for supplying charged particles, said cathode and anode producing in response to a voltage potential energetic primary electrons and low energy background electrons for ionizing said gas;

means for applying a voltage potential between said cathode and anode whereby said energetic primary electrons and low energy background electrons are produced; and

means for maintaining said screen grid at a marginally positive voltage potential with respect to said cathode, and at a larger negative voltage with respect to said anode whereby said high energy electrons migrate to said grid along with ions produced by collisions of said electrons and gas, and exit said grid forming a neutralized ion beam.

4,419,204

INSTALLATION FOR THE ELECTRO-DEPOSITION OF METALS, PARTICULARLY ALUMINUM

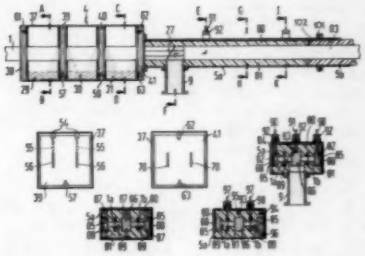
Siegfried Birkle, Hoechstadt; Johann Gehring, Spardorf, and Klaus Stoeger, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 419,546

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1981, 3137908

Int. Cl.³ C25D 17/00

U.S. Cl. 204—206 9 Claims



1. In an installation for electro-deposition of metals particularly for the deposition of aluminum from an aprotic, oxygen-free and water-free aluminum-organic electrolyte onto elongated goods, said installation comprising a tubular cell which is closed to the outside, receives the goods to be treated, has anodes extending therealong, and has means to cathodically contact the goods to be treated; conveying means for moving the goods continuously in an axial direction in the cell along the anodes; and pump means for circulating the electrolyte through the cell in a direction opposite the direction of motion of the goods, said cell having lock means consisting of a plurality of chambers for preventing the outflow of electrolyte from the tubular cell disposed at each end of the tubular cell, the improvements comprising said tubular cell comprising at least two interconnected rectangular metal tubes, each tube having a flange at each end for forming a connection, and interchangeable, nonconductive insert pieces being disposed in said tubular cell, said pieces being matched to the interior dimensions of the rectangular tubes and being shaped to provide at least two longitudinal channels for guiding the goods to be metallized and for positioning the anodes surrounding the goods to be metallized in the flow of electrolyte, and said conveying means and each of the chambers of the lock means being designed along with the two channels to enable simultaneous processing of at least two elongated goods.

4,419,205

APPARATUS FOR PREPARING MEAT FOOD PRODUCTS HAVING REDUCED SHRINKAGE

Peter W. Rose, R.R. 3 Covered Bridge Rd., So. Barrington, Ill. 60010

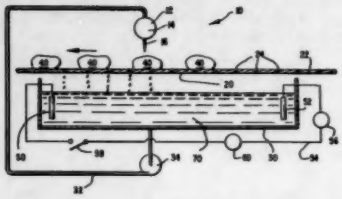
Division of Ser. No. 165,850, Jul. 7, 1980, Pat. No. 4,276,313, which is a continuation-in-part of Ser. No. 139,795, Apr. 14, 1980, Pat. No. 4,264,632, which is a continuation-in-part of Ser. No. 129,727, Mar. 12, 1980, Pat. No. 4,264,631. This application Mar. 11, 1981, Ser. No. 242,477

Int. Cl.³ C25B 15/08, 9/00

U.S. Cl. 204—228 4 Claims

1. In an apparatus for treating meat which includes meat support means, liquid injection means for injecting an aqueous meat treating solution into said meat movably positioned above said meat support means, and a reservoir for said meat treating solution positioned at a lower level than said meat injection means and communicating with said liquid injection means, the improvement which comprises a pair of spaced electrodes in

said reservoir capable of delivering a current concentration of at least about 0.001 amperes per liter of said solution in said reservoir, and



a direct current power source and an on-off switch operably associated with said spaced electrodes to pass current through said solution, said on-off switch being in an open position to stop the flow of current prior to the injection of said meat treating solution.

4,419,206

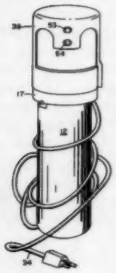
ELECTRONIC WATER TREATING DEVICE

James R. Frame, 346 Sandau Rd., San Antonio, Tex. 78216

Continuation of Ser. No. 129,611, Mar. 12, 1980, abandoned, which is a continuation of Ser. No. 267, Jan. 2, 1979, abandoned. This application Apr. 28, 1981, Ser. No. 258,505

Int. Cl.³ C25B *15/00, 9/00, 11/12;* **C02F** *1/46*

U.S. Cl. 204—228 **5 Claims**



1. A water treating device comprising:

a body portion having water inlet and outlet aperture means formed therein;

an anode removeably secured through electrical insulator means to said body portion;

cannister cathode means removeably secured to said body portion such that the interior of said cannister cathode is in fluid communication with said inlet and outlet aperatures and said anode is centrally disposed in said cannister cathode;

circuit means electrically connected to said anode and said cannister cathode for providing a flow of direct current through said anode and cannister cathode and through water flowing through said cannister cathode; and

a standpipe in fluid communication with said water inlet aperture and projecting away from said body portion adjacent said anode, whereby water entering said cannister cathode is introduced at the base thereof.

2. A water treating device as in claim 1 wherein said circuit means comprises:

first circuit means for providing a flow of direct current through said anode and said canister cathode and through water flowing through said canister cathode; and

second circuit means for providing an indication that the resistence of said anode has increased beyond a predetermined value due to an accumulation of material deposits thereon.

4,419,207

ELECTROLYTIC HALOGEN GENERATORS

Jeffrey P. Bindon, 11 Edinburgh Crescent, Westville, 3630, Natal, South Africa

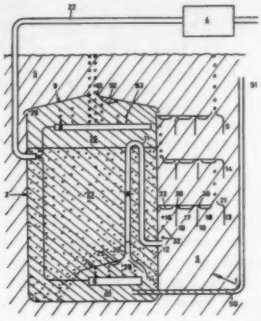
Filed Jun. 7, 1982, Ser. No. 385,800

Claims priority, application South Africa, Jun. 8, 1981, 81/3816

The portion of the term of this patent subsequent to Feb. 14, 1999, has been disclaimed.

Int. Cl.³ C25B *9/00, 1/34, 15/08*

U.S. Cl. 204—237 **6 Claims**



1. An electrolytic halogen generator comprising a cell which is submersible in a liquid and which includes a cathode adapted for location above a halide bed and an anode adapted for location therebelow, the cell being formed with a discharge aperture, at a high point, for the gaseous product formed at the cathode, is characterised in that inlet means is provided, which, in combination with the discharge of the cathode products through the discharge aperture, is adapted to promote a liquid flow in the electrolyte in a direction from the anode to the cathode.

4,419,208

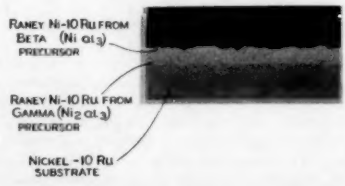
RANEY ALLOY COATED CATHODE FOR CHLOR-ALKALI CELLS

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 23, 1981, Ser. No. 324,188

Int. Cl.³ C25B *11/08;* **B01J** *35/00*

U.S. Cl. 204—290 R **4 Claims**



1. An improved low overvoltage electrode for use as a hydrogen evolution cathode in an electrolytic cell, the electrode having a Raney metal surface layer in electrical contact with a conductive metal core, characterized by the improvement in which said electrode is comprised of a porous Raney metal alloy surface layer integral with and derived from a monolithic nickel-ruthenium alloy conductive metal core,

wherein said Raney metal alloy surface layer is predominantly derived from an adherent (Ni-Ru)Al_3 Beta phase structured crystalline precursory alloy, and wherein the weight percentage of ruthenium in the nickel-ruthenium portion of said Raney metal alloy surface layer is between about 5 and about 15%.

4,419,209

SOLID POLYMERIC ELECTROLYTE

Peter R. Klinkowski, Norwalk, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 285,196
Int. Cl.³ C25B *13/08*; B01D *13/00*
U.S. Cl. 204—296 5 Claims

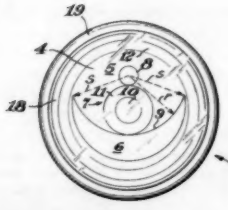
1. A solid polymeric electrolyte comprising a three-phase structure including a porous, woven or unwoven, substantially inert, fiber substrate, a film, impregnating said substrate, comprising fine particles of an ion exchange resin and a water insoluble matrix of an organic binder essentially permanently binding said particles to said fiber substrate and to each other, said binder having been precipitated onto said substrate from a mixture of binder, an organic solvent therefor and resin particles in suspension, by contact with a diluent characterized by a high degree of miscibility with said organic solvent and a relatively low degree of compatibility with said binder, forming an essentially continuous film of ion exchange resin and binder on said fiber substrate and in the interstices thereof capable of receiving a deposit thereon in the form of a cake of particulate solids, said solid polymeric electrolyte being essentially impervious to water.

4,419,210

POLAROGRAPHIC ELECTRODE

Minchen Wang, Bayside, N.Y., assignor to Photovolt Corporation, Midland, Mich.

Filed Aug. 9, 1982, Ser. No. 406,687
Int. Cl.³ G01N *27/54*
U.S. Cl. 204—403 10 Claims



1. A membrane electrode comprising an analyte permeable membrane conformed to a smooth surface of a solidified filler martrix of an insulator material, which smooth surface is further comprised of the exposed surfaces of embedded electrodes which are flush with the adjacent surface of the filler matrix, the electrodes comprising an auxiliary electrode, working electrode, and reference electrode, the geometry of the auxiliary electrode defining a critical boundary which is an arc generated from a radius rotated about a point which is the center of the working electrode, the reference electrode being in the sector defined by the arc of the auxiliary electrode and the center of the working electrode.

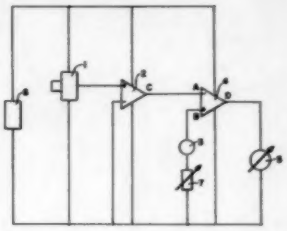
10. The membrane electrode of claim 1 in which the membrane comprises immobilized glucose oxidase enzyme sandwiched between analyte permeable film membrane layers.

4,419,211

GAS ANALYSIS SENSOR FOR MEASURING CONCENTRATION OF GAS CONSTITUENT

Lothar Brauer, Bussealiee 14, 1000 Berlin 37, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,905
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3109224
Int. Cl.³ G01N *27/54*
U.S. Cl. 204—408 3 Claims



1. A gas analysis sensor for measuring gas concentration of a gas constituent and including an electronic instrument wherein a voltage is produced from the sensor which is proportional to the concentration of a gas constituent to be measured and said voltage is fed to an indicating device, the improvement comprising said electronic instrument further including:

a pressure-sensitive module adapted to be subjected to said gas concentration and to convert detected gas pressure into an electrical signal;

an amplifier connected to amplify said electrical signal; and

a differential amplifier having an invertible input connected to receive said amplified signal and a non-inverting input connected to receive said voltage and having its output connected to said indicating device for energization thereof, said differential amplifier means adapted to automatically adjust said voltage by an amount corresponding to variations in said voltage created by atmospheric pressure changes applied to said sensor and thereby provide said output with values compensated for changing atmospheric pressure such that said indicating device indicates true gas concentration unaffected by variations in atmospheric pressures.

4,419,212

COMBINATION GAS OXYGEN CONCENTRATION AND COMBUSTION LIGHT SENSOR

Hermann Dietz, Gerlingen; Gerhard Holfelder, Weissach-Flacht; Klaus Müller, Tamm, and Harald Reber, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,194
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104410
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—424 10 Claims

1. Unitary oxygen concentration and combustion light sensor to determine

(a) light emission phenomena upon combustion of a fuel-air mixture in a combustion chamber, especially the combustion chamber of an internal combustion (IC) engine; and

(b) the concentration of oxygen in resulting combustion gases,

having

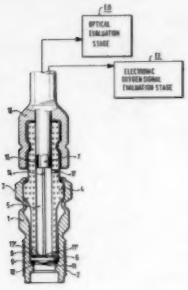
an elongated tubular housing (1) formed with attachment means (2, 3) to expose one end of the housing to the combustion chamber

comprising, in accordance with the invention, the combination of

a solid electrolyte body of a light transmission ceramic material (6) positioned in the housing;

electrodes (11, 11', 11c, 11'c, 12) applied to the solid electrolyte body;

and connection means (9, 14, 15) connected to the electrodes for forming externally accessible terminals to apply signals derived from said electrode to an electronic oxygen signal evaluation stage (EE) to evaluate the oxygen content of the gases resulting from combustion of the fuel-air mixture in the combustion chamber;



with

a light guide (7) positioned in optically coupled relation to the combustion chamber and secured in the tubular housing, to transmit light signals representative of combustion processes in the combustion chamber to an optical combustion process evaluation stage (EO) to optically evaluate the combustion process upon occurrence of combustion of said fuel-air mixture

for conjoint and simultaneous sensing of changes in chemical composition of the atmosphere in the combustion chamber upon occurrence of combustion and the optical phenomena of said combustion.

4,419,213

OXYGEN SENSING ELEMENT FORMED AS LAMINATE OF THIN LAYERS ON SUBSTRATE PROVIDED WITH HEATER AND LEAD WIRES

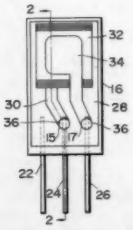
Masaharu Oshima; Kenji Ikezawa, and Hiroyuki Aoki, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 12, 1982, Ser. No. 348,265

Claims priority, application Japan, Feb. 19, 1981, 56-22242

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—425 **7 Claims**



1. An oxygen sensing element having a substrate comprising a ceramic material, an oxygen concentration cell in the form of a laminate of thin layers placed on a major surface of the substrate, said laminate including an oxygen ion conductive solid electrolyte layer, a reference electrode layer adjacent the solid electrolyte layer and a measurement electrode layer adjacent the solid electrolyte layer, an electric heater embedded in the substrate and a plurality of lead wires having end portions inserted into the substrate and respectively connected to the heater and the reference and measurement electrode layers, wherein

the electrical connection of each of the lead wires connected to said concentration cell includes a conductor filled hole formed in the substrate so as to open at said surface of the substrate, and wherein

the inserted end portion of a first one of the lead wires, through which a current flows to the heater, is in close contact with a terminal portion of the heater substantially over the entire length of the inserted end portion and is completely shielded from environmental atmosphere by the substrate.

4,419,214

PROCESS FOR THE RECOVERY OF SHALE OIL, HEAVY OIL, KEROGEN OR TAR FROM THEIR NATURAL SOURCES

Valer Balint; Andras Pinter, and György Mika, all of Budapest, Hungary, assignors to Orszagos Koolaj es Gazipari Troszt and Budapesti Muszaki Egyetem, both of Budapest, Hungary

Filed Oct. 22, 1981, Ser. No. 314,050

Claims priority, application Hungary, Dec. 23, 1980, 3091/80

Int. Cl.³ C10G *1/00*; C10B *53/06, 57/00*

U.S. Cl. 208—8 R **9 Claims**

1. A method for the recovery of a hydrocarbon product from a natural source thereof which comprises the steps of:

(a) enclosing the mineral source in a pressure vessel;

(b) exposing the mineral source in said pressure vessel to microwave irradiation at a frequency selected from the group which consists of 915±50 mHz, 2375±50 mHz and 2450±50 mHz;

(c) simultaneously with the exposure of said mineral source in said pressure vessel to microwave irradiation, feeding an expelling medium selected from the group which consists of carbon tetrachloride, chloroform and chlorinated-fluorinated hydrocarbons through said pressure vessel to entrain the hydrocarbon product therefrom, said expelling medium having a dielectric constant of less than 5 at 3 GHz; and

(d) recovering said hydrocarbon product from said medium.

4,419,215

METHOD OF PRE-HEATING PARTICLES OF A HYDROCARBON-BEARING SUBSTRATE AND AN APPARATUS THEREFOR

Heinz Voetter; Hubrecht C. A. Van Meurs; Richard C. Darton, all of The Hague, and Rajamani Krishna, Amsterdam, all of Netherlands, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Apr. 19, 1982, Ser. No. 369,684

Claims priority, application United Kingdom, Apr. 22, 1981, 8112490

Int. Cl.³ C10G *1/00*; F28D *13/00*

U.S. Cl. 208—11 R **14 Claims**

1. A method of preheating particles of a hydrocarbon-bearing substrate by means of hot spent substrate, said particles having a diameter of 0.5 to 5 mm; comprising the steps of:

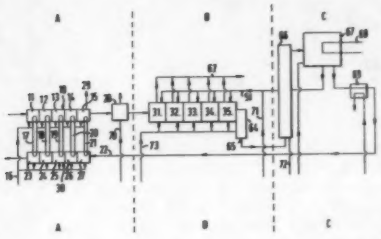
providing a horizontal fluidized flow of hydrocarbon-bearing substrate and a horizontal fluidized flow of hot spent substrate, while maintaining the hot spent substrate in indirect, countercurrent flow with respect to the flow of the hydrocarbon-bearing substrate;

providing a series of heat transfer loops defining two or more heat transfer stages located between the flows of the hydrocarbon-bearing substrate and the hot spent substrate, each heat transfer loop containing a circulating heat transfer fluid,

and each loop being in heat transfer contact with each of said fluidized flows;

choosing said heat transfer fluids such that part of the loops operate in the temperature range of from 65° to 100° C. and part in the temperature range of from 100° to 300° C.

maintaining the horizontal flow of the hot spent substrate in substantially fluidized bed condition in two or more stages, said hot spent substrate being cooled in a staged manner;



maintaining the horizontal flow of the hydrocarbon-bearing substrate in a substantially fluidized bed condition in two or more stages; and

indirectly heating the hydrocarbon-bearing substrate in a staged manner from ambient temperature to about 250° C. by means of heat transferred from the hot spent substrate by the heat transfer loops.

4,419,216

PROCESS OF RECOVERING OIL FROM OIL-CONTAINING MATERIALS

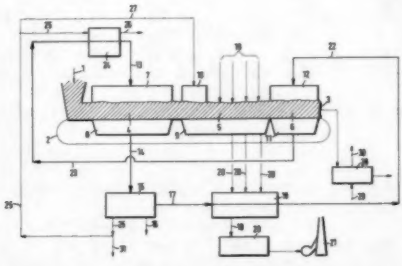
Norbert Magedanz, Hasselroth; Horst Seidel, and Hans J. Weiss, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 387,074

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124277

Int. Cl.³ C10G *1/02*; C10B *53/06*

U.S. Cl. 208—11 R **9 Claims**



1. In a process of recovering oil from an oil-containing a mineral consisting essentially of charging, said oil-containing mineral onto a travelling grate, passing a hot gas through the bed in a retorting zone to heat the bed to the retorting temperature, entraining the resulting vapors and gaseous retorting products by the retorting gases, separating oil from the retort gases in a separating stage, burning solid carbon in the resultant retorted bed in a succeeding combustion zone by means of an oxygen-containing gas passed therethrough, removing gases from oil in the separating zone and passing said gasses through the bed in a succeeding cooling zone, and recycling the resultant heated gases to the retorting zone, the improvement wherein the retort gases are passed directly to said separating stage, the solid carbon in a top layer of said bed is ignited by means of an ignition furnace at the beginning of the combustion zone, oxygen-containing gases are sucked through the bed thereafter to cause the burning zone to move through the bed from top toward bottom, partial stream of the gas which is leaving the separating stage is heated by an indirect heat exchange with the exhaust gases from the combustion zone and is passed through the bed in the cooling zone, and are reheated therein and is then recycled to the retorting zone, and a partial stream of the gas that is leaving the separating stage is discharged.

4,419,217

PROCESS FOR IMPROVING THE YIELD OF SHALE OIL

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 17, 1983, Ser. No. 467,415

Int. Cl.³ C10G *1/00*

U.S. Cl. 208—11 R **4 Claims**

1. A method for increasing the yield of liquid oil from spent shales comprising (1) treating a spent shale with a mixture of from about a 10:1 to about a 1:10 ratio by volume of methanol to water at a temperature of between about 225° and 350° C. at a pressure of from about 900 to about 2750 psi for from about 10 minutes to about four hours, (2) removing the methanol-water mixture and (3) retorting the treated spent shale, resulting in the recovery of from about 10% to 40% more oil from the spent shale than was obtained in the original retorting process.

4,419,218

CATALYTIC CONVERSION OF SHALE OIL

Philip J. Angevine, West Deptford; Günter H. Kühl, and Sadi Mizrahi, both of Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 8, 1981, Ser. No. 281,450

Int. Cl.³ C10G *47/16*

U.S. Cl. 208—59 **9 Claims**

1. A process for selectively converting a previously hydrotreated shale oil to a fraction primarily in the 400°–650° F. boiling range, comprising contacting said shale oil with a ZSM-12 crystalline aluminosilicate zeolite having a silica-to-alumina ratio greater than about 12 said shale oil having been previously hydrotreated at a temperature of about 650°–850° F., a pressure of about 500 to 3000 psig, and hydrogen/oil ratio of about 1,000–10,000 SCF/B and an LHSV of about 0.2–2.95 and thereafter hydroprocessing under shale oil conversion conditions sufficient to convert from at least about 50 to about 95% of the unconverted treated shale oil present based on the weight of the oil to said 400°–650° F. fraction.

4,419,219

ADSORPTION OF BASIC ASPHALTENES ON SOLID ACID CATALYSTS

Robert B. Long, Atlantic Highlands, and Fred A. Caruso, Elizabeth, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

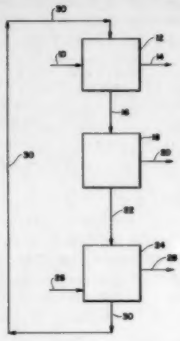
Filed Sep. 24, 1981, Ser. No. 305,267

Int. Cl.³ C10G *11/04*, *25/00*, *25/12*

U.S. Cl. 208—86 **10 Claims**

1. A process for selectively removing basic asphaltenes from a basic asphaltene-containing hydrocarbon feed that contains less than about 1 wt. % water which comprises contacting said feed with a regenerated solid acid catalyst at a temperature below about 575° F. for a time sufficient to selectively absorb at least a portion of said basic asphaltenes onto said solid acid

to produce a hydrocarbon feed of reduced basic asphaltene content, wherein said solid acid catalyst has been calcined to



remove adsorbed water from the surface thereof prior to being contacted with said feed.

4,419,220

CATALYTIC DEWAXING PROCESS

Rene B. LaPierre, Medford; Randall D. Partridge, Princeton; Nai Y. Chen, Titusville, all of N.J., and Steven S. Wong, Langhorne, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 18, 1982, Ser. No. 379,422

Int. Cl.[3] C10G *47/16*

U.S. Cl. 208—111 10 Claims

1. A process for dewaxing a hydrocarbon feedstock containing straight chain paraffins, which comprises contacting the feedstock with a catalyst comprising zeolite beta having a silica:alumina ratio of at least 30:1 and a hydrogenation component under isomerization conditions.

4,419,221

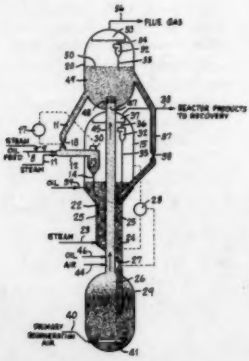
CRACKING WITH SHORT CONTACT TIME AND HIGH TEMPERATURES

Leonce F. Castagnos, Jr., Nederland, and Roy E. Pratt, Neches, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 27, 1981, Ser. No. 315,468

Int. Cl.[3] C10G *11/18;* B01J *8/36*

U.S. Cl. 208—113 6 Claims



4. In a fluidized catalytic hydrocarbon conversion process wherein hydrocarbon conversion is carried out in a transport type reaction zone in the presence of hot freshly regenerated catalyst, spent catalyst from said reaction zone is stripped of volatile hydrocarbons in a catalyst stripping zone in admixture with hot freshly regenerated catalyst, and stripped catalyst is regenerated with an oxygen-containing gas in a catalyst regeneration zone, the improvement which comprises introducing only freshly regenerated cracking catalyst directly from the regeneration zone into a substantially horizontal transport reaction zone maintained at an elevated cracking temperature in the range of 1150° to 1350° F. in contact with hydrocarbon feedstock and passing said catalyst and hydrocarbon feedstock through said reaction zone with an average contact time in the range of 0.1 to 1 second, discharging reaction products and spent catalyst from said reaction zone into a separation zone, and effecting substantially complete separation of hydrocarbon convesion products from spent catalyst in said separation zone.

4,419,222

HYDROCARBON CONVERSION PROCESSES USING IMPROVED TRANSITION METAL OXIDE CATALYSTS

Dane C. Grenoble, Baton Rouge, La.; Chang J. Kim, Somerset, and Lawrence L. Murrell, South Plainfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 203,141, Nov. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 927,828, Jul. 25, 1978, Pat. No. 4,233,139. This application Dec. 18, 1981, Ser. No. 332,162

Int. Cl.[3] C10G *11/04, 11/16*

U.S. Cl. 208—120 17 Claims

1. A hydrocarbon conversion process comprising contacting a hydrocarbon feed, at elevated temperature and in a conversion zone, with a solid acid catalyst comprising at least one catalytic metal oxide selected from the group consisting of the oxides of (a) tungsten, niobium and mixtures thereof and (b) mixtures of (a) with tantalum, hafnium, chromium, titanium, zirconium and mixtures thereof supported on a silica-containing inorganic refractory metal oxide support, the silica content of which is less than 50 wt.% of the total support, said catalyst being steamed at a temperature at least 600° C. prior to use.

4,419,223

CARBO-METALLIC OIL CONVERSION WITH WATER

George D. Myers, and Lloyd E. Busch, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 94,217, Nov. 14, 1979, Pat. No. 4,347,122, Continuation-in-part of Ser. No. 94,227, Nov. 14, 1979, Pat. No. 4,354,923, and a continuation-in-part of Ser. No. 319,570, Nov. 9, 1981, which is a division of Ser. No. 94,091, Nov. 14, 1979, Pat. No. 4,299,687. This application Apr. 30, 1982, Ser. No. 373,599

The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.

Int. Cl.[3] C10G *11/18*

U.S. Cl. 208—120 153 Claims

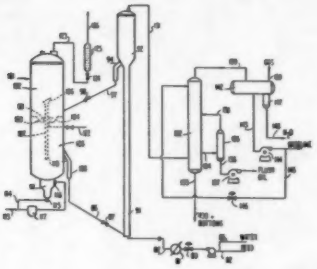
2. A process for economically converting carbo-metallic oils to lighter products, comprising:

I. providing a converter feed which contains at least about 70% by volume of 650° F.+ material characterized by a carbon residue on pyrolysis of at least about 2 and by containing at least about 5.5 ppm by weight of Nickel Equivalents of heavy metal(s);

II. bringing said converter feed together with cracking catalyst having an equilibrium microactivity test conversion activity level of at least about 60 volume percent and bearing an accumulation of at least about 3,000 ppm by weight of Nickel Equivalents of heavy metal(s), expressed as metal(s) on regenerated equilibrium catalyst, and with additional material in a weight ratio relative to feed of up to about 0.4 including H_2O in a weight ratio relative to feed of at least about 0.04 to form a stream comprising a suspension of said catalyst in said feed and said additional material wherein the catalyst to feed weight ratio is at least about 6 and the ratio of the partial pressure of the

additional material relative to the partial pressure of the feed is in the range of about 0.8 to about 4, and causing the resultant stream to flow at a linear velocity of at least about 35 feet per second through a progressive flow type reactor having an elongated reaction chamber which is at least in part vertical or inclined for a vapor residence time in the range of about 0.5 to about 2.5 seconds at a reaction chamber outlet temperature of about 900 to about 1,300° F. and under a total pressure of about 15 to about 35 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 60% to about 90%, while producing at least about 6% coke by weight based on fresh feed and laying down coke on the catalyst in amounts in the range of about 0.3 to about 3% by weight;

III. abruptly separating catalyst from product vapors at the downstream end of said elongated reaction chamber, discharging the catalyst thus separated into a catalyst



collection chamber, and preventing at least about 80% by volume of the total feed and product vapors which have passed through said elongated reaction chamber from having further contact with the thus separated catalyst in said catalyst collection chamber;

IV. stripping said separated catalyst;

V. regenerating said catalyst with oxygen-containing combustion-supporting gas under conditions of time, temperature and atmosphere sufficient to reduce the carbon on the catalyst to about 0.25% by weight or less, while forming combustion product gases which comprise CO and/or CO_2, and maintaining the $CO:CO_2$ molar ratio of those combustion product gases formed from the burning of at least the major portion of the coke at a level of at least about 0.25 while such gases are in heat exchange contact with the catalyst; and

VI. recycling the regenerated catalyst to the reactor at a temperature of at least about 1,275° F. for contact with fresh feed.

4,419,224

DESULFURIZATION OF HYDROCARBONS

J. Wayne Miller, and John W. Ward, both of Yorba Linda, Calif., assignors to Union Oil Company of California, Brea, Calif.

Continuation of Ser. No. 211,376, Nov. 28, 1980, Pat. No. 4,336,130. This application Jun. 21, 1982, Ser. No. 390,676

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.³ C10G *29/04, 29/06*

U.S. Cl. 208—244 **14 Claims**

1. A process comprising (a) contacting a hydrocarbon feedstock containing organo-sulfur compounds with a reduced catalytic absorbent comprising one or more nickel components and one or more platinum group metal promoters composited with a porous refractory oxide, said contacting being under substantially non-hydrogenative conditions including an elevated temperature such that a substantial proportion of said organo-sulfur compounds is removed from said feedstock and said catalytic absorbent increases in sulfur content; and (b) recovering a hydrocarbon product stream containing less organo-sulfur compounds than are contained in said feedstock.

4,419,225

DEMETALLIZATION OF HEAVY OILS

Simon G. Kukes, and Thomas Davis, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1983, Ser. No. 480,204

Int. Cl.³ C10G *17/00, 45/00, 29/04, 29/00*

U.S. Cl. 208—251 R **8 Claims**

1. A method for treating metal containing hydrocarbon feed streams comprising contacting said hydrocarbon feed stream with an amount of elemental phosphorus of at least about 0.5 weight percent based on the weight of the hydrocarbon continuing feed stream at demetallizing temperatures and pressures sufficient to convert said metals to oil insoluble compounds.

4,419,226

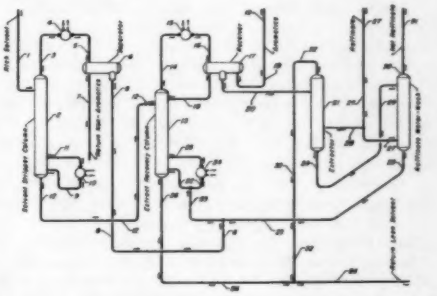
RECOVERY OF AROMATIC HYDROCARBONS AND A NON-AROMATIC RAFFINATE STREAM FROM A HYDROCARBON CHARGE STOCK

George F. Asselin, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 26, 1980, Ser. No. 163,446

Int. Cl.³ C07C *7/08*

U.S. Cl. 208—325 **5 Claims**



1. A process for the recovery of aromatic hydrocarbons and a raffinate stream substantially free of aromatics from a hydrocarbon charge containing both aromatic and non-aromatic hydrocarbons which comprises:

(a) treating said hydrocarbon charge stock in an extraction zone in contact with an aromatics-selective solvent composition at conditions selected to provide a first aromatics-rich solvent stream containing non-aromatic hydrocarbons and a first raffinate stream comprising non-aromatic hydrocarbons and residual solvent;

(b) treating said first aromatics-rich solvent stream in a first separation zone at conditions selective to separate substantially all of the non-aromatic hydrocarbons therefrom and to provide a second aromatics-rich solvent stream;

(c) treating said second aromatics-rich solvent stream in a second separation zone in contact with stripping steam at conditions selected to provide an aromatics stream comprising aromatics and steam condensate and a lean solvent stream substantially free of aromatic hydrocarbons;

(d) treating said aromatics stream of (c) in a third separation zone at conditions selected to provide a high purity aromatics stream and a first aqueous stream containing steam condensate and residual aromatics;

(e) returning said lean solvent stream of (c) to said extraction zone of (a);

(f) treating said first aqueous stream of (d) containing resid-

ual aromatics in a first contacting zone with a minor first portion of said raffinate stream removed from said extraction zone in (a) at conditions selected to provide a second aqueous stream containing less than 100 ppm aromatic hydrocarbons, and an aromatics containing second raffinate stream;

(g) returning said aromatics-containing second raffinate stream of (f) to said extraction zone of (a);

(h) treating said second aqueous stream of (f) with a major second portion of said first raffinate stream of (a) in a second contacting zone at conditions selected to provide a third raffinate stream substantially free of aromatic hydrocarbons and a solvent-containing aqueous stream; and

(i) recovering said third raffinate stream substantially free of aromatics.

4,419,227

RECOVERY OF SOLVENT FROM A HYDROCARBON EXTRACT

Philip B. Sherman, Orange, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 12, 1982, Ser. No. 377,294

Int. Cl.³ C10G *21/20, 21/28*

U.S. Cl. 208—326 **8 Claims**

1. In a process for solvent refining a lubricating oil feedstock wherein said lubricating oil feedstock is contacted under pressure with N-methyl-2-pyrrolidone as a selective solvent for aromatic constituents of said feedstock in an extraction zone under solvent refining conditions thereby forming a raffinate phase comprising raffinate and a part of said solvent and an extract phase comprising extract and a part of said solvent, said raffinate phase is separated from said extract phase, and said solvent is removed from said extract phase by vaporization serially in a first solvent vaporization zone at a pressure less than that of said extraction zone and in a plurality of zones at progressively higher pressure and wherein heat from an external source is supplied only to said last high pressure vaporization zone and heat for each preceding vaporizaton zone is supplied by heat exchange with vapors from each succeeding vaporization zone, and the extract and solvent mixture from the high pressure vaporization zone is subjected to flash vaporization in a subatmospheric pressure flash zone followed by stripping with a gaseous stripping medium, the improvement which comprises heating the extract solvent mixture from the subatmospheric flash zone in a heating zone in admixture with added normally gaseous inert gas to a temperature at least 5° C. higher than the temperature of said last high pressure vaporization zone, introducing the resulting heated mixture comprising inert gas, solvent and extract into a stripping zone, and removing additional solvent from said extract solvent mixture by stripping with an inert stripping gas at a low superatmospheric pressure.

4,419,228

PROCESS FOR PRODUCING HIGH BRIGHTNESS CLAYS UTILIZING MAGNETIC BENEFICIATION AND CALCINING

Jerry A. Cook, Tennille, and Gary L. Cobb, Davisboro, both of Ga., assignors to Anglo-American Clays Corporation, Sandersville, Ga.

Continuation-in-part of Ser. No. 180,976, Aug. 25, 1980, Pat. No. 4,343,694. This application Aug. 6, 1982, Ser. No. 406,074

The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.

Int. Cl.³ B03B *1/00*

U.S. Cl. 209—9 **25 Claims**

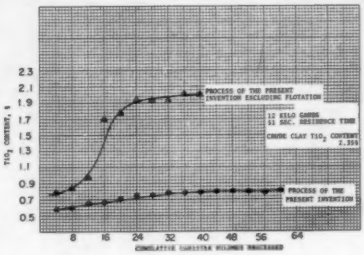
1. A method for producing a low-abrasion, high brightness calcined clay from a crude kaolin clay containing titaniferous and iron-containing discolorants, comprising the steps of:

forming a dispersed aqueous slurry of said clay, containing a deflocculant, and a fatty acid collecting agent; and conditioning said slurry to coat said discolorants with said collecting agent, to thereby render same hydrophobic;

adding to said slurry a system of sub-micron sized magnetic ferrite seeding particles, the surfaces of which have been rendered hydrophobic;

mixing said seeded slurry to coalesce said hydrophobic surfaced discolorants with said hydrophobic-surfaced seeding particles;

subjecting said seeded slurry to a froth flotation to remove substantial quantities of said discolorants and seeding



particles coalesced therewith, and to remove excess seeding particles and coalesced seeding particles, and to remove excess of the fatty acid collecting agent;

subjecting the flotation-beneficiated clay slurry to a magnetic separation to remove further quantities of the discolorants and seeding particles associated therewith, and to remove seeding particles unassociated with said discolorants; and

calcining the product from said magnetic separation, at a temperature of at least 1500° F.

4,419,229

DEVICE FOR CONTROLLING THE CATION SATURATION IN INTERCHANGING FILTERS

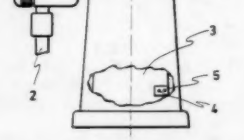
Roque Rubio Salas, Barcelona, Spain, assignor to Bayard J. R. International S.A., Barcelona, Spain

Filed Jan. 5, 1982, Ser. No. 337,272

Claims priority, application Spain, Nov. 10, 1981, 261.311[U]

Int. Cl.³ C02B *1/40*

U.S. Cl. 210—85 **1 Claim**



1. In a water treatment apparatus of the ion exchange type and including a bed of ion exchange resins, and means for determining the relative degree of saturation of said resins, the improvement wherein said determining means comprises means for detecting a predetermined reduction in the ion exchange capacity of said resins, said detecting means comprising:

a source of electric power;

a first electrode positioned within said resin bed and electrically connected to said power source for receiving therefrom a potential signal;

a second electrode positioned within said resin bed, without being electrically connected to said power source, for providing a potential signal representative of the ion exchange capacity of said resins;

tracking circuit means, connected to said first and second electrodes, for receiving said signals from said first and second electrodes and for generating a difference signal representative of the difference in potential therebetween;

comparator means, connected to said tracking circuit means and having a threshold value representative of a predetermined reduction in the ion exchange capacity of said resins, for receiving said difference signal from said tracking circuit means, for comparing said difference signal with said threshold value, and for generating an activating signal when said difference signal exceeds said threshold valve; and

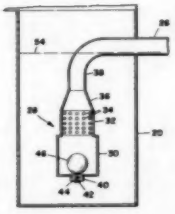
alarm means, connected to said comparator means, for receiving and being activated by said activating signal, thereby generating an alarm indicative of the occurrence of a predetermined reduction in the ion exchange capacity of said resins.

4,419,230

APPARATUS FOR CONTAINING A LEAKAGE OF PCB COMPOUND

Tommy A. Horton, and Michael D. Augustyn, both of Bremerton, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1982, Ser. No. 342,634
Int. Cl.³ B03D *3/00*
U.S. Cl. 210—114 **10 Claims**



1. Apparatus for confining a leakage of PCB from equipement to an enclosed volume and allowing water to be discharged when no PCB is present, which comprises:

(a) a containment receptacle having sufficient volume to hold the maximum PCB leakage, said equipment being disposed within said containment receptacle;

(b) a catch basin disposed lower than said receptacle and communicating with said receptacle for receiving liquid run-off from said receptacle, said catch basin having a discharge outlet; and

(c) a water/PCB separator float valve disposed in said catch basin, said valve comprising:

(1) a vertical, tubular valve body, said body having a flow-through section having apertures which communicate with the interior of the catch basin and a converging section of circular cross-section above said flow-through section, the smaller end of said converging section being coupled to the discharge outlet of said catch basin so that any material discharged from said catch basin through said discharge outlet must pass through the converging section of said valve body;

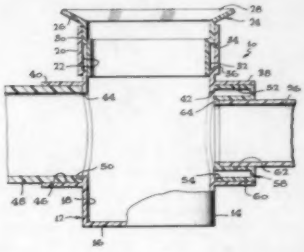
(2) a spherical float confined in said tubular valve body below said converging section, said spherical float having a specific gravity between that of PCB and water, said spherical float being adapted to seat in said converging section to seal said converging section, whereby said float will sink in water to allow water entering said valve body to flow through said converging section to said discharge outlet and whereby said float will rise on PCB such that as the level of PCB increases in the catch basin, buoyant forces on the float will cause the float to be seated in the converging section to prevent PCB from flowing through said converging section to said discharge outlet, thereby confining the PCB to the catch basin and the containment receptacle.

4,419,231

GROUND SURFACE DRAINAGE APPARATUS

Edward L. Friedl, 6797 Little Ct., Coloma, Calif. 95613

Filed Jul. 23, 1981, Ser. No. 286,000
Int. Cl.³ E03F *1/00*
U.S. Cl. 210—164 **4 Claims**



1. A ground surface drainage apparatus comprising:

a catch basin, said catch basin having a substantially tubular cylindrical body arranged to be uprightly positioned below the ground surface to receive drainage water therein, said body having a closed bottom, an interior body diameter, and an open top edge, said top edge consisting of and being defined by a single horizontal upwardly directed annular body stop shoulder;

an upper sleeve integrally formed with said body at the top thereof, said upper sleeve being a cylindrical tube having an interior surface with an inner diameter larger than said interior body diameter to surround said body shoulder, said sleeve having a top edge consisting of a single horizontal upwardly directed annular sleeve shoulder;

a grate for positioning at the top of said sleeve and body so that ground surface water can pass through said grate downwardly into said catch basin, said grate having grate bars thereon to restrict flow of debris into said catch basin, said grate having a downwardly directed cylindrical neck of an outer diameter to slidingly fit within said interior surface of said upper sleeve on said catch basin body, said grate also having a downwardly directed tube integrally formed with said neck, said downwardly directed tube being smaller than said neck to form a single horizontal downwardly directed annular stop shoulder therebetween at the bottom end of said neck, said tube having an outer diameter the same as said interior body diameter so as to slidingly fit within said catch basin body, said stop shoulder on said bottom end of said neck and said stop shoulder on said catch basin body facing each other and spaced from each other to avoid contact, said sliding fit of said neck and tube with said sleeve and body, respectively, providing lateral positional security of said grate with respect to said body, said grate having outwardly extending flanges for resting upon said upper sleeve shoulder for vertical security, said stop shoulders being only for selectable insertion therebetween of an extension tube.

4,419,232
FILTERING AND COLLECTING DEVICE FOR WATER DRAINS

Oscar S. Arntyr, Wallingatan 37, S-111 24 Stockholm, and Thord I. Engström, S-950 18 Bensbyn, both of Sweden

Filed Nov. 9, 1981, Ser. No. 319,753
Claims priority, application Sweden, Oct. 1, 1981, 8105804
Int. Cl.³ E03F *1/00*
U.S. Cl. 210—164 6 Claims

1. A filter device for an outdoor water drain in a paved roadway gutter or the like, said drain having an outer protective grating 12 for preventing vehicles, pedestrians and large objects from falling therethrough, said filter device serving to separate and collect particulate impurities such as sand, twigs and leaves, and also oil and other liquid impurities passing through the grating, and comprising:

a continuous holder member (1) adapted to be mounted beneath the drain grating, said holder member having downwardly depending, fluid impervious sides, a relatively rigid and shallow coarse-filtering wire basket (2) removably disposed within said holder member and having downwardly depending sides, and a fine-filtering bag (3) made of a flexible and water-permeable cloth or fabric material removably disposed around the outside of said holder member and depending downwardly beyond the sides thereof and substantially below said wire basket, whereby said bag may be shifted laterally away from a vertical axis of the filter device below the holder member to accommodate for irregularities in the drain structure, said holder member including support means (5) extending inwardly from lower edges of its sides for supporting the wire basket, and said support means also serving as a handle by which the holder member and bag may be lifted together to facilitate emptying the bag.

4,419,233
CHLORINATOR FOR A SWIMMING POOL

Marvin E. Baker, 815 Ewing Ave., Nashville, Tenn. 37203

Filed Nov. 18, 1981, Ser. No. 322,465
Int. Cl.³ E04H *3/20*
U.S. Cl. 210—169 5 Claims

1. A chlorinator system for a swimming pool comprising:

(a) a swimming pool having a surrounding deck level and having a normal water level within the swimming pool,

(b) a water re-circulating system including a pump, a drain line from the pool to the intake side of the pump, and a return line from the discharge side of the pump to the pool, the return line terminating in an inlet port through the wall of the swimming pool below said normal water level,

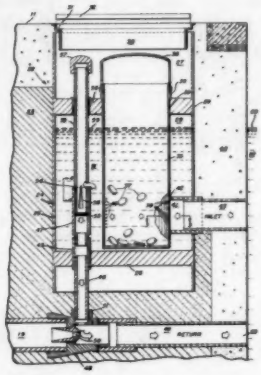
(c) a housing having an enclosing side wall, a bottom wall adjacent said swimming pool wall exteriorly of said swimming pool, said bottom wall being below the normal water level of the swimming pool,

(d) a transverse partition wall spanning said housing and spaced between said bottom wall and said open top portion to define a closed liquid chamber within said housing below said partition wall and a control chamber above said partition wall within said housing, said partition wall having a container opening therethrough,

(e) a container for receiving soluble water-treatment agents, said container being received within said liquid chamber and projecting upwardly through said container opening into said control chamber, said container having an open upper end within said control chamber for receiving said water-treatment agents,

(f) water inlet apertures in one side of said container below said partition wall,

(g) water outlet apertures in the opposite side of said container from said inlet apertures,



(h) a water inlet line in direct fluid communication between said swimming pool and said water inlet apertures, said inlet line being below said normal water level,

(i) said water outlet apertures being in fluid communication with said liquid chamber,

(j) a standpipe member extending through, and projecting above, said bottom wall, and terminating at a predetermined height within said liquid chamber to provide a liquid outlet from said liquid chamber above said bottom wall and said inlet port to said swimming pool and below said normal water level,

(k) a Venturi orifice in said return line, and

(l) said standpipe member being in fluid communication with said return line downstream of said Venturi orifice, so that the liquid from said liquid chamber flows by aspiration into said return line when water from the pump is flowing through said return line.

4,419,234
MULTIPLE CARTRIDGE FILTER ASSEMBLY WITH REMOVABLE FILTER CARTRIDGE ARRAY

John D. Miller, Homer, and Clayton L. Reed, Tolly, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 305,069, Sep. 24, 1981, abandoned. This application Aug. 6, 1982, Ser. No. 406,095
Int. Cl.³ B01D *27/08*
U.S. Cl. 210—232 10 Claims

1. A multiple cartridge filter assembly comprising:

(a) a housing having upper and lower portions securable face-to-face to form an enclosed sealed spaced having an inlet for pre-filtered fluid and an outlet for filtrate;

(b) a removable filter array comprising:

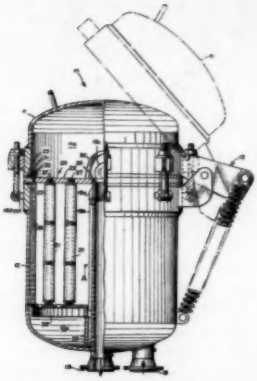
(1) a plurality of elongated filter cartridges each having a blind end and an adapter at the other end for axial engagement with a mating adapter;

(2) a separation plate securable substantially horizontally

within the housing in a working condition in which the separation plate defines upper and lower filter chambers, one chamber being for prefiltered fluid, the other chamber being for filtrate, the separation plate having a plurality of adapters to mate form below with the adapters of filter cartridges, the filter cartridge adapter creating a fluidtight seal with the separation plate adapter with the former axially engaged with the latter;

(3) a filter cartridge support platform; and

(4) means connecting the support platform to the separation plate in a substantially horizontal position beneath the blind ends of the filter cartridges, the connection between the separation plate and the support platform permitting the support platform to shift between a first



position in which it retains the filter cartridge adapters axially engaged with the separation plate adapters and a second position wherein the support platform is spaced from the separation plate by a greater distance than in the first position, the spacing between the separation plate and the support platform with the latter in the second position being sufficient to permit the insertion and removal of the filter cartridges, the support plate automatically assuming the second position unless restrained from beneath, and

(c) stop means within the housing for holding the support platform in substantially the first position when the removable filter array is within the housing with the separation plate in its working condition.

4,419,235

GRAVITY FED WATER TREATMENT APPARATUS

Boris Sway, 7201 W. Aracoma Dr., Cincinnati, Ohio 45237

Continuation of Ser. No. 310,527, Oct. 13, 1981, abandoned. This application Jan. 28, 1983, Ser. No. 462,100

Int. Cl.³ B01D *27/02*

U.S. Cl. 210—282 **8 Claims**

1. An apparatus for removing chlorine, chlorinated hydrocarbons and other organic materials from drinking water, comprising:

(a) a first container having an open top for receiving water and a restricted opening in its bottom portion for discharging water, said container having slightly converging vertical walls for receiving a predetermined quantity of water and to serve as a temporary reservoir for the water, said restricted opening having threads about its periphery;

(b) a disposable cartridge containing at least one-half ounce of activated carbon particles ranging between 10 and 60 mesh in size, said disposable cartridge having a vertical length of at least two inches and a diametral dimension of approximately one inch and being threadably connected to and in open fluid communication with the restricted opening in the first container, said disposable cartridge having a plurality of apertures in its bottom portion said first container and said disposable cartridge being dimensioned so as to discharge water through said plurality of apertures at a flow rate between approximately 0.0125 and 0.02 gallons per minute when said predetermined quantity of water is placed in said first container;

(c) a second container having a larger capacity than the first container, having a top opening sized to receive said

cartridge and having a first container-supporting top surface, said disposable cartridge being at least partially disposed within the second container to discharge water passing into the second container; and

(d) a plurality of ridges on the bottom of said first container, extending radially outward from said restricted opening across and contacting said top surface of the first container when the disposable cartridge is disposed within the second container.

4,419,236

WATER DETECTING OR ABSORBING DEVICE FOR USE IN AND REMOVAL FROM A TANK WITH A LIMITED OPENING

Charles J. Hsu, P.O. Box 460 Grand Central Station, New York, N.Y. 10017

Filed Mar. 11, 1982, Ser. No. 357,070

Int. Cl.³ B01D *27/02*

U.S. Cl. 210—282 **16 Claims**

1. A device for detecting the presence of or for absorbing water from the bottom of a closed tank or the like having a restricted opening through which the device is inserted into and removed from the tank comprising an envelope closed along the sides thereof and providing an interior space, said envelope formed of a porous cover material capable of transmitting liquid water into the interior space in said envelope, a

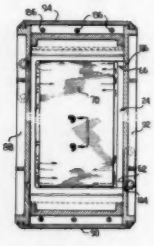
filler material located within the interior space within said envelope forming a loose pulverized dry filling, for affording maximum absorbency said filler material is liquid water absorbent but does not absorb liquids which do not contain water and said filler material has the characteristic of expanding to many times its dry volume when it absorbs liquid water, said filler material after it absorbs liquid water can be returned to the unexpanded dry state by drying only, the liquid water cannot be squeezed out of said filler material, at least one weighted member is located within the interior space along with said filler material so that said weighted member causes said device to sink to the bottom of the tank into which it is inserted, said weighted member comprises a generally flat disc-like member having a circumferentially extending edge surface having a maximum diametrical dimension determining the minimum diameter tank opening through which said device can be inserted and said envelope being dimensioned and filled with a selected amount of said pulverized filler material so that when said filler material absorbs liquid water and expands, the maximum dimension of the expanded said envelope generally perpendicular to the direction of removal through the tank opening is not greater than the maximum diametrical dimension of the circumferentially extending edge surface of said weighted member whereby said device after absorbing water can be removed out of the opening through which it was inserted into the tank.

4,419,237

PLEATED KIDNEY

William G. Esmond, 800 Country Club Rd., Havre de Grace, Md. 21078

Filed Aug. 9, 1977, Ser. No. 823,029
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.2 **11 Claims**



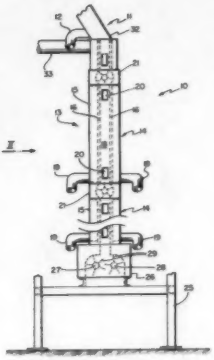
1. A dialyzer comprising a stack of first and second plates arranged in alternating relation, a membrane between adjacent plates, cooperating surfaces on said plates together with each membrane defining flow paths for different fluids on opposite sides of each membrane, and sealing means carried by said plates forming seals with said membranes, said seals being in the form of said plates being formed of a deformable soft plastic material and said plates having ribs thereon forcing said membranes into said plates, each plate being of a generally rectangular outline, said flow paths being generally transverse of said plates, and said ribs being disposed only transverse of said plates adjacent opposite ends thereof and spaced from said flow path.

4,419,238

JUICE DRAINER

Philip L. Shaw, Victoria, Australia, assignor to Lindeman (Holdings) Limited, New South Wales, Australia

Continuation of Ser. No. 194,716, Oct. 7, 1980, abandoned, which is a continuation of Ser. No. 32,591, Apr. 23, 1979, abandoned. This application Jul. 2, 1982, Ser. No. 394,572
Claims priority, application Australia, Apr. 24, 1978, PD4152
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—338 **5 Claims**



1. A juice extraction apparatus for extracting juice from crushed grapes continuously passing through the apparatus, said apparatus comprising a generally vertically extending housing, a vertically extending screen located within the housing and dividing the interior of said housing into a vertical first passage to receive the crushed grapes and through which the grapes pass unhindered under the influence of gravity and a second passage to receive juice filtered from the grapes via said screen, an inlet at the top of said housing in communication with said first chamber to enable crushed grapes to be delivered to said first chamber, a juice outlet in said housing communicating with said second chamber to drain filtered juice therefrom, lock means terminating the lower end of said first passage to regulate the flow of crushed grapes through said first passage and wherein said lock means includes a casing with curved side walls, a driven shaft, a plurality of radial vanes extending from said shaft and co-operating with said casing to inhibit the movement of crushed fruit past the vanes, and drive means to continuously turn said shaft to regulate the flow of crushed grapes through said second passage.

4,419,239

APPARATUS FOR RECOVERING AND RECYCLING ANIMAL WASTE

Gerald P. Frankl, 187 McCook Lake, Jefferson, S. Dak. 57038

Filed Apr. 14, 1982, Ser. No. 368,166
Int. Cl.³ B01D *23/02*
U.S. Cl. 210—413 **13 Claims**

1. Apparatus for separating a mixture of liquid and solid materials comprising:

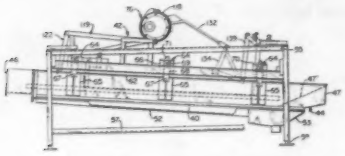
a lower receptacle;

an elongated screen positioned over said receptacle, said screen having an opening size adapted to permit liquid and a preselected size of solid particles to pass by gravity therethrough;

means for delivering said mixture of liquid and solid materials and depositing said mixture of materials at one end of said screen; and

separator means operative to advance said mixture of materials along the length of said screen including a series of scraper blades and horizontally disposed pressure pad members extending at spaced intervals along the length of

said screen with each said scraper blade and pad member extending in a direction transversely of the length of said screen and pad having a broad surface portion in facing relation to said screen, and shuttle drive means operatively connected to said scraper blades and pad members to continuously and repeatedly advance and reverse said scraper blades and pad members in unison and in a linear



to-and-fro movement lengthwise of said screen to successively move downwardly into engagement with said mixture of materials on said screen for a limited distance substantially less than the length of said screen, then be raised and reversed in movement to their original positions whereby to incrementally advance said mixture of materials deposited onto said screen across the entire length of said screen.

4,419,240

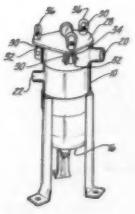
FLUID FILTERING DEVICE

Borje O. Rosaen, 4031 Thornoaks, Ann Arbor, Mich. 48104

Filed Jul. 30, 1982, Ser. No. 403,343

Int. Cl.³ B01D *29/10*

U.S. Cl. 210—444 **6 Claims**



1. For use in conjunction with a high flow liquid fluid system, a liquid fluid filtering device comprising:

a housing having an axially extending interior chamber and an open top;

said housing having a fluid inlet and a fluid outlet open to said chamber, said fluid inlet adapted for connection to the high flow liquid fluid system,

a seat secured to said housing within said chamber at a position spaced downwardly from said open top, said seat protruding into said chamber and forming an axially extending inner surface,

a filter element removably insertable into said chamber through said open top and to a filtering position in which said filter element is positioned between said inlet and said outlet, said filter element comprising a flanged portion which abuts against a top of said seat when said filter element is in said filtering position and an outer surface which extends axially outwardly from said flanged portion,

means for preventing severe tippage of said filter element and for maintaining a fluid seal between said filter element and said housing despite slight tippage when said filter element is in said filtering position comprising:

a seal carried at a midpoint on said axially extending inner surface of said seat, said seal engaging said filter element outer surface when said filter element is in said filtering position,

a cover and means for detachably securing said cover to said housing so that said cover closes the open top of said housing,

an elongated handle pivotally secured at one end to said filter element, said handle being dimensioned so that, when said filter element is in said filtering position and said cover is secured to said housing, the other end of said handle is positioned closely adjacent an intersection of said cover with said housing.

4,419,241

TUBULAR FILTER ELEMENT FOR THE FILTRATION OF FLUIDS

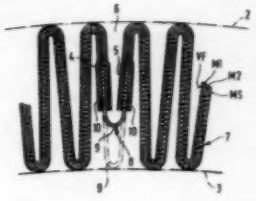
Jürgen Hoffmann, Diemarden, Fed. Rep. of Germany, assignor to Sartorius GmbH, Göttingen, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,113

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128546

Int. Cl.³ B01D *27/06, 29/06*

U.S. Cl. 210—493.5 **12 Claims**



1. In a pleated cylindrical filter for the filtration of fluids wherein the filter is constructed from a flat filter blank material, the material has a plurality of layers, the flat filter blank is pleated and the pleated filter material is bent to form an elongated cylinder with the folds of the pleats extending longitudinally with respect to the axis of the cylinder, the cylinder has an elongated junction zone consisting of the opposite edge portions of the blank which extend inwardly and radially, the improvement comprising an elongated connecting means in said junction zone, the connecting means having oppositely located elongated edge portions affixed between layers of said opposite edge portions of the blank, the connecting means forming an elongated, generally, longitudinal V-shaped fold, the apex of the fold extends inwardly and radially in the general direction of the flow of fluids through the filter, and the edge portions form legs of the fold extending outwardly and radially into the blank.

4,419,242

COMPOSITE MEMBRANE FOR A MEMBRANE DISTILLATION SYSTEM

Dah Y. Cheng, Los Altos, and Steve J. Wiersma, Sunnyvale, both of Calif., assignors to International Power Technology, Inc., Sunnyvale, Calif.

Division of Ser. No. 118,192, Feb. 4, 1980, Pat. No. 4,316,772, which is a continuation-in-part of Ser. No. 12,047, Feb. 14, 1979, Pat. No. 4,265,713. This application Feb. 18, 1982, Ser. No. 350,078

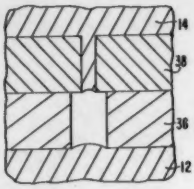
Int. Cl.³ B01D *3/02, 13/00*

U.S. Cl. 210—500.2 **12 Claims**

1. A composite membrane comprising:

a microporous hydrophobic layer through which water can pass in the form of a vapor;

a first hydrophilic layer on one surface of said microporous hydrophobic layer; said hydrophilic layer forming a barrier to prevent a salt bearing liquid from intruding with the pores of said hydrophobic layer;



a second hydrophilic layer on the opposite surface of said hydrophobic layer; and said materials forming said second hydrophilic and said hydrophobic layers, and the pore sizes of said hydrophobic layer, being selected to prevent water-logging of said hydrophobic layer when there is a heat gradient across said membrane.

4,419,243
GROWTH OF BIOMASS

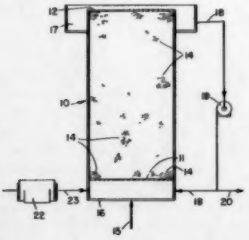
Bernard Atkinson, Copthorne; Geoffrey M. Black, Sale; Anthony Pinches, Offerton, and Paul J. S. Lewis, Abbotts Langley, all of England, assignors to The University of Manchester Institute of Science and Technology and Simon-Hartley Limited, both of Manchester, England

Continuation-in-part of Ser. No. 156,038, Jun. 3, 1980, abandoned, which is a division of Ser. No. 945,869, Sep. 26, 1978, abandoned. This application Feb. 11, 1982, Ser. No. 347,872

Claims priority, application United Kingdom, Oct. 20, 1977, 43613/77; Oct. 20, 1977, 43614/77; Oct. 20, 1977, 43615/77

Int. Cl.³ C02F *3/10*

U.S. Cl. 210—618 **5 Claims**



1. A process for promoting the growth of biomass from a supply of suitable nutrient material, comprising the steps of providing a vessel in which is contained a biomass support medium in the form of a plurality of movable bodies each having a substantially uniform recticular structure defining an internal voidage consisting of a multiplicity of interconnected pores such as to provide throughout the voidage of each body a protective environment which will permit biomass growth therewithin and thus support and sustain active biomass as a substantially integral mass retained by said recticular structure, the average pore size of said bodies lying in the range of 0.3 mm to 1 mm in diameter, said protective environment thereby allowing each body to fill with biomass over a period of time, there being an extensive area of access by way of a multiplicity of openings defined by said reticular structure at the external surface of each said body to the whole of the voidage therein, the overall shape and reticular structure of each body being sufficiently plain as to enable the bodies to move relative to each other with a rubbing or knocking action without interlocking or packing together as a solid unit; causing the nutrient and any additional substances required for the process to flow through the vessel thus to contact and enter the bodies within the vessel; and causing relative movement of the bodies within the vessel during the growth process sufficiently for restricting accumulation of biomass outwardly from the outer surface of each said body and thus preventing overfill of biomass onto the external surface of each said body.

4,419,244
METHOD AND ARRANGEMENT FOR AERATION OF LIQUIDS

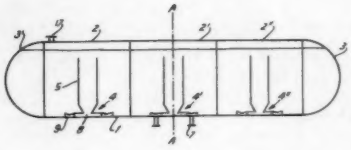
Hans Müller, Erlenbach, and Felix Müller, Staefa, both of Switzerland, assignors to Chemap AG, Männedorf, Switzerland

Continuation-in-part of Ser. No. 81,450, Oct. 3, 1979, abandoned. This application Dec. 10, 1981, Ser. No. 329,567

Claims priority, application Switzerland, Oct. 10, 1978, 10503/78

Int. Cl.³ C02F *3/20*; C12M *1/06, 1/08*

U.S. Cl. 210—629 **7 Claims**

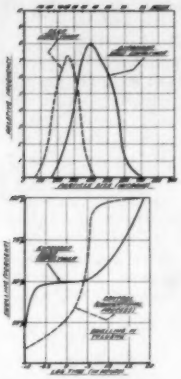


1. A method of aerating liquids for aerobic growing of micoorganisms, in an elongated container extending in a substantially horizontal direction and containing a liquid, said container having a plurality of liquid-filled zones arranged adjacent to one another in direction of elongation of said container, the method comprising the steps of: providing a plurality of means each located in each of said zones for forming in each of said zones a longitudinally advancing stream of the liquid accommodated in said container, wherein each of said means for forming a longitudinal stream includes a stationary distributing element mounted on a container bottom and arranged to exit the liquid in the direction of elongation of said container, and a conduit provided for each distributing element for supplying air; providing a plurality of means each located in each of said zones for forming in each of said zones a circumferentially advancing stream of the liquid accommodated in said container, wherein each of said means for forming a circumferential stream of liquid includes a substantially upright conduit tube and an impeller communicating with the same and rotatable about a substantially upright axis so as to form said circumferential stream; and arranging said distributing element of each said means for forming said longitudinal stream to surround said impeller of each of said means for forming said circumferential stream so that said rotatable impeller rotates relative to said stationary distributing element, so as to cause superposition of said circumferential stream and said longitudinal stream in each of said zones and to form a composite closed spiral-shaped stream of liquid in said container travelling in the direction of elongation of said container through all said zones over substantially the entire length of said container.

4,419,245
COPOLYMER PROCESS AND PRODUCT THEREFROM CONSISTING OF CROSSLINKED SEED BEAD SWOLLEN BY STYRENE MONOMER

James H. Barrett, Feasterville; Thomas J. Howell, Langhorne, and George M. Lein, Jr., Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 30, 1982, Ser. No. 393,953
Int. Cl.³ C08F 2/18; B01J 41/14, 39/20
U.S. Cl. 210—681 23 Claims



1. A seed process for manufacturing crosslinked ion exchange copolymer particles capable of withstanding swelling pressures without fracturing upon subsequent functionalization which comprises:

(a) forming an agitated aqueous suspension of polymerized lightly crosslinked styrenic or ethylenic seed particles in the absence of an amount of polymeric protective colloids which would prevent imbibition of monomers into the seed particles;

(b) feeding to said suspended seed particles under polymerization conditions from 2:20 parts by weight of the seed of a monomer or monomer mixture comprising (I) 0 to 98% by weight of said monomer or monomer mixture of at least one monoethylenically unsaturated styrenic or ethylenic monomer and (II) 2–100% by weight of said monomer or monomer mixture of at least one polyethylenically unsaturated styrenic or ethylenic crosslinking monomer, while balancing the suspension conditions, the feed rate, the agitation and the polymerization rate to avoid particle agglomeration and ultimately produce said ion exchange copolymer particles, until the seed particles have swollen to the desired size by imbibition of the monomer or monomer mixture;

(c) continuing polymerization of the swollen seed particles until said ion exchange copolymer particles result; and

(d) separating said ion exchange copolymer particles from the aqueous suspension medium.

4,419,246
REMOVAL OF HEAVY METAL IONS

Madhusudan D. Jayawant, Hockessin, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Sep. 30, 1982, Ser. No. 430,879
Int. Cl.³ C02F 1/52, 1/72
U.S. Cl. 210—721 15 Claims

1. Method for removing from a aqueous waste or process stream heavy metal ions selected from iron, copper and nickel present in complexed water-soluble form comprising contacting with agitation said waste or process stream for a residence time of at least 0.1 hour at a pH adjusted to between about 10.2 and 12.5 with a magnesium ion donor compound, a peroxygen compound and either calcium hydroxide or calcium oxide so as to form derivatives of said heavy metal ions which precipitate, and removing said precipitate from the waste or process stream, leaving a total content of iron, copper and nickel of less than 15 mg/l in the treated aqueous waste, said magnesium compound being present, basis magnesium, in a minimum ratio of 0.05:1 by weight the total weight of iron, copper and nickel, and said peroxygen compound being present, on the basis of active oxygen, at a weight ratio of 0.12:1 to 50:1 of the total weight or organic carbon in the waste stream.

4,419,247
METHOD OF REMOVING SOLUBLE SULFIDE RESIDUE FROM SCRUBBER WATER WASTE

Alfred M. Tenny, 1335 Hickory Rd., Homewood, Ill. 60430

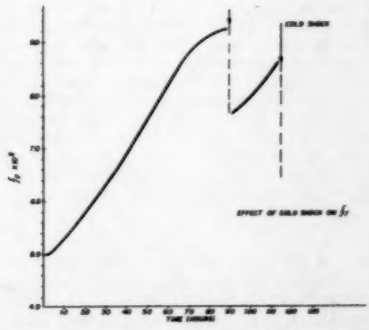
Filed May 8, 1981, Ser. No. 261,944
Int. Cl.³ C02F 1/58
U.S. Cl. 210—726 2 Claims

1. The method of removing soluble sulfide residue from scrubber water waste and the like which comprises adding to said scrubber water waste an acidic copper waste in an amount whereby the copper ion added is sufficient to precipitate no more than 90 percent of the sulfide ion present, removing the precipitated copper sulfide, and thereafter adding a pickle acid waste containing ferrous ions in an amount sufficient to essentially completely react with all sulfide present and to precipitate as an iron-copper sulfide mixture.

4,419,248
BIOFILM REMOVAL

John W. F. Costerton, Calgary, Canada, assignor to Her Majesty the Queen in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources, Edmonton, Canada

Filed Apr. 5, 1982, Ser. No. 365,260
Int. Cl.³ C02F 1/22
U.S. Cl. 210—764 10 Claims



1. A method for removing biofilm from a submerged fouled surface in an industrial aquatic conduit, said biofilm comprising bacteria associated with glycocalyx containing water, said biofilm being adherent to the surface, which comprises:

cooling the biofilm to below the freezing point of water to thereby generate large sharp-edged ice crystals;

thawing the frozen biofilm;

and then removing at least part of the biofilm from the surface.

5. A method for removing biofilm on the surface of a heat exchanger normally exposed to water flow, said biofilm comprising bacteria associated with glycocalyx containing water and adhering to said surface, which comprises:

slowly cooling the biofilm to below the freezing point of water to thereby generate large sharp-edged ice crystals;

thawing the frozen biofilm;

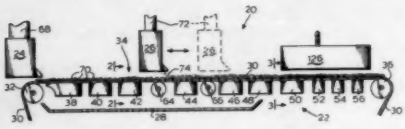
and then removing at least part of the biofilm by liquid flow across the surface.

4,419,249

METHOD AND APPARATUS FOR DEWATERING A SLURRY OF FINE PARTICLES

Joseph A. Bolton, Queensbury, and Louis L. Dufresne, Glen Falls, both of N.Y., assignors to Albany International Corp., Menands, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,085
Int. Cl.³ B01D *37/00*
U.S. Cl. 210—783 **18 Claims**



1. An apparatus for dewatering a slurry of particles comprising: forming fabric; means for driving said forming fabric with said means being sized; primary headbox being sized for feeding a first slurry of particles at a predetermined rate onto the forming fabric; secondary headbox being sized for feeding a second slurry of particles at a predetermined rate onto the first slurry of particles deposited on the forming fabric; suction means being sized and positioned so as to provide a vacuum on forming fabric passing thereby; sand forming fabric being of sufficient porosity and said suction means providing sufficient vacuum so as to allow dewatering of the first and second slurry of particles on the forming fabric by the suction means; and said means for driving said forming fabric drives at a rate sufficient to provide a mat of essentially only two discrete layers on the forming fabric.

10. A method for dewatering a slurry of particles comprising: providing headbox, secondary headbox, suction means, forming fabric of preselected porosity, and means for driving the forming fabric; feeding a first slurry of particles at a first rate from the primary headbox onto the forming fabric; feeding a second slurry of particles at a second rate from a secondary headbox onto the first slurry of particles; creating a sufficient vacuum on the first and second slurry of particles through the forming fabric by the suction means to cause dewatering of the first and second slurries thereon; driving said forming fabric at a fourth rate of speed by the driving means; and said first, second, third and fourth rates of speed being sufficient so as to provide a mat of essentially only two discrete layers.

4,419,250

AGGLOMERATED BENTONITE PARTICLES FOR INCORPORATION IN HEAVY DUTY PARTICULATE LAUNDRY SOFTENING DETERGENT COMPOSITIONS.

Edwin Allen, Oupeye; Alan Dillarstone, Rocourt, and Joseph A. Reul, Heusy, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,712
Int. Cl.³ C09K *3/18;* **C11D** *3/14, 11/00;* **D06M** *11/06*
U.S. Cl. 252—8.6 **5 Claims**

1. Agglomerated bentonite particles, useful for incorporation in a particulate heavy duty detergent composition for use in automatic washing machines which comprise such agglomerated bentonite particles with which there is included a dispensing assisting proportion, at least 0.15%, of a salt of a lower alkyl siliconic acid and/or polymerization product(s) thereof formed therefrom on storage.

4. A method of manufacturing agglomerated bentonite particles, useful for incorporation in a particulate heavy duty detergent composition which is dispensable from the charging compartment of an automatic washing machine by action of water being fed through such compartment, which comprises applying to surfaces of agglomerated bentonite particles a dispensing assisting proportion, at least 0.15%, of a salt of lower alkyl siliconic acid.

4,419,251

AQUEOUS LUBRICANT

Joosup Shim, Wenonah, and Derek A. Law, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 16, 1982, Ser. No. 419,107
Int. Cl.³ C10M *1/24, 1/36, 1/48, 1/40*
U.S. Cl. 252—32.7 E **15 Claims**

1. A lubricant concentrate for forming oil-in-water emulsions upon dilution with water comprising a suitable mineral base oil having a viscosity ranging from about 60 SSU to about 6,000 SSU blended with:

(1) about 20 to 65% by weight of an emulsifier/dispersant system comprising:
  (a) an alkali or alkaline earth metal soap of rosin acids, and
  (b) an alkylene oxide condensation product of a fatty amine or the reaction product thereof with a polyalkenylsuccinic acid or anhydride, and
(2) about 10 to 20% by weight of an antiwear/antirust inhibitor system comprising:
  (c) a zinc dialkyldithiophosphate, and
  (d) a metal dialkylnaphthalene sulfonate.

4,419,252

AQUEOUS LUBRICANT

Joosup Shim, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 22, 1982, Ser. No. 436,157
Int. Cl.³ C10M *1/24, 1/36, 1/40, 1/48*
U.S. Cl. 252—32.7 E **15 Claims**

1. A lubricant concentrate for forming oil-in-water emulsions upon dilution with water comprising a suitable mineral base oil having a viscosity ranging from about 60 SSU to about 6,000 SSU blended with:

(1) about 20 to 65% by weight of an emulsifier/dispersant system comprising:
  (a) an alkali or alkaline earth metal soap of rosin acids, and
  (b) an alkylene oxide condensation product of a fatty amine or the reaction product thereof with a polyalkenylsuccinic acid or anhydride, and
(2) about 10 to 20% by weight of an antiwear/antirust inhibitor system comprising:
  (c) a zinc dialkyldithiophosphate, and
  (d) a metal dialkylnaphthalene sulfonate, and
(3) about 0.001 to 3.0% by weight polyisobutylene.

4,419,253

SYNTHETIC POST-PICKLE FLUID

Carl S. Kennedy, Dyer, and Theodore A. Hack, Munster, both of Ind., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 6, 1981, Ser. No. 318,974
Int. Cl.³ C10M *3/18, 3/26*
U.S. Cl. 252—34.7 **11 Claims**

1. A synthetic post-pickle fluid consisting essentially of an aqueous solution of from about 1 to about 6 percent of a dibasic carboxylic acid selected from the group consisting of azelaic acid, adipic acid, succinic acid, sebacic acid and mixtures thereof and from about 2 to about 10 percent of a base selected from the group consisting of potassium hydroxide, monoethanolamine, diethanolamine, and mixtures thereof.

4,419,254

METHOD OF PROTECTING SILVER CONTACTS

Shuhei Kosaka, Ota, and Toshihiro Fujii, Ojima, both of Japan, assignors to Toshiba Silicones Limited, Waterford, N.Y.

Filed May 7, 1981, Ser. No. 261,417
Claims priority, application Japan, May 9, 1980, 55-61504
Int. Cl.³ C10M *1/38, 1/52*
U.S. Cl. 252—37 17 Claims

1. A method of protecting silver contacts comprising applying to said silver contacts a grease comprising:

(A) 100 parts by weight of a polyorganosiloxane represented by the general formula:

$$\left(R_a^1SiO_{\frac{(4-a)}{2}}\right)_n$$

wherein R^1 is a monovalent group selected from the group consisting of methyl, ethyl, propyl, phenyl and halogenated phenyl groups, a is a number from 1.9 to 2.7, and n is a positive integer;

(B) 0.01 to 50 parts by weight of a thickener; and

(C) 0.01 to 3 parts by weight of an organomercaptan represented by the general formula:

$$R^2SH$$

wherein R^2 represents a saturated or unsaturated aliphatic hydrocarbon group having 18 to 22 carbon atoms.

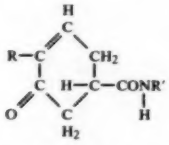
4,419,255

LUBRICATING OIL CONTAINING KETO AMIDE AS FRICTION REDUCING AGENT

Benjamin J. Kaufman; Robert A. Sawicki, both of Wappingers Falls, and Stephen A. Levine, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,321
Int. Cl.³ C10M *1/32*
U.S. Cl. 252—51.5 A 42 Claims

34. A cyclic keto amide comprising:



wherein R is hydrogen or C_1–C_{17} alkyl, and

is an amine moiety.

4,419,256

BUILDING INSULATION COMPOSITION

Richard E. Loomis, Texarkana, Ark., assignor to Delron Research and Development Corporation, South Bend, Ind.

Filed Nov. 12, 1981, Ser. No. 320,313
Int. Cl.³ C04B *43/16;* E04B *1/78*
U.S. Cl. 252—62 14 Claims

1. A building insulation comprising thirty-five percent (35%) to fifty-three percent (53%) by weight of cellulose fiber, three percent (3%) to five percent (5%) by weight of an acid-containing fire retardant for reducing the flammability of said cellulose, seven percent (7%) to nine percent (9%) by weight of expanded silicate glass for reducing the corrosive effect of said acid-containing fire retardant, and thirty-five percent (35%) to fifty-three percent (53%) by weight of mineral wool.

4,419,257

MAGNETIC COATING COMPOSITION

Duncan W. Frew, Alamo; Zorro Stefanini, San Jose; Edward A. Schnee, Byron, and Leo di Ricco, San Jose, all of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed Nov. 12, 1981, Ser. No. 320,454
Int. Cl.³ H01F *1/02*
U.S. Cl. 252—62.54 13 Claims

1. In a magnetic coating composition of the type having magnetic particles dispersed in a resin binder, the improvements comprising the use of a phosphate-ester dispersant and a solvent system including a dibasic ester wherein said solvent system has a initial Hansen three-dimensional solubility parameter range of approximately 10.5 to 11.0 and a Hansen three-dimensional solubility parameter range of approximately 9.3 to 10.0 after approximately 99% of the solvent has evaporated from the binder.

4,419,258

DIALKYL GLYOXYLATE SURFACTANTS

Marvin M. Crutchfield, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 30, 1982, Ser. No. 430,551
Int. Cl.³ C07C *59/10;* C11D *1/04*
U.S. Cl. 252—89.1 10 Claims

1. A compound of the formula:

wherein R and R′ are independently a C_6–C_{10} aliphatic group or said aliphatic group containing an average in the range of about 1 to about 3 oxyethylene units and M is alkali metal, ammonium or alkanolammonium.

7. A detergent composition comprising a detergency builder and at least one compound of the formula:

wherein R and R′ are independently a C_6–C_{10} aliphatic group or said aliphatic group containing an average in the range of about 1 to about 3 oxyethylene units and M is alkali metal, ammonium or alkanolammonium.

4,419,259

DEGREASING AND DEOXIDIZING ALUMINUM FOIL

Donald J. Riley, Cliffside Park, N.J., and John W. Scott, Clinton, Tenn., assignors to Sprague Electric Company, North Adams, Mass.

Filed Oct. 22, 1981, Ser. No. 313,874
Int. Cl.³ C11D *7/08;* C23G *1/02*
U.S. Cl. 252—142 8 Claims

1. A process for degreasing and deoxidizing raw aluminum foil before processing for electrolytic capacitors comprises contacting said foil with a solution consisting essentially of 1.0 to 7.0 M phosphoric acid, an agent corrosive to aluminum, and a nonionic surfactant at a temperature of 45° to 85° C. for a contacting time of 20 to 240 seconds without preferential etching of said foil.

4,419,260
METHOD FOR THE PRODUCTION OF A SUDS-STABILIZED SILICONE-CONTAINING DETERGENT

Herbert Reuter, Hilden, Fed. Rep. of Germany; Herbert Saran, deceased, late of Dusseldorf, Fed. Rep. of Germany (by Karin Saran nee Müller, heiress), and Martin Witthaus, Dusseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,596

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1981, 3128631

Int. Cl.³ C11D *3/12, 9/36, 11/02, 17/00*

U.S. Cl. 252—174.13 **15 Claims**

1. A method for the production of a suds-stabilized silicone-containing detergent by the spray-drying of an aqueous slurry mixture with a content of:

(A) customary tensides, builder salts and other detergent components which are stable under spray-drying conditions, and

(B) suds-stabilizing silicones which method comprises jointly passing an aqueous slurry mixture containing components (A) and a separately produced aqueous dispersion containing suds-stabilizing silicones (B), and a film-forming, high-molecular-weight polymer, which is soluble or swellable in water, in an amount sufficient for the formation of microcapsules, said suds-stabilizing silicones being present in said aqueous dispersion in a particle size of from 0.5 μm to 40 μm,

through a spray nozzle into an air-heated fall space and recovering said suds-stabilized silicone-containing detergent.

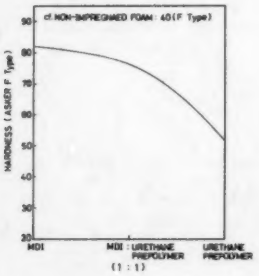
4,419,261
IMPREGNANT FOR MAKING SEMI-RIGID OR RIGID RESIN FOAMS

Nobuhiro Takahashi, Tajimi, Japan, assignor to Wako Kemikaru Kabushiki Kaisha, Aichi, Japan

Filed Sep. 23, 1980, Ser. No. 190,098

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—182 **21 Claims**



1. An impregnant for converting a soft resin foam of open cells to a semi-rigid or rigid resin foam consisting essentially of an isocyanate selected from the group consisting of 4,4'-diphenyl-methanediisocyanate, tolylenediisocyanate and a mixture thereof, and a polyurethane prepolymer obtained by reacting an isocyanate selected from the group consisting of tolylenediisocyanate, 4,4'-diphenylmethanediisocyanate and a mixture thereof with a polyol having a molecular weight of about 1500–4000 and 2–4 functional groups in such proportions that the content of NCO groups in the prepolymer is in the range of below 15%, and wherein the mixing ratio of the first-mentioned isocyanate to the prepolymer is in the range of 1:9 to 9:1 and an organic inert solvent mixed therewith, said solvent selected from the group consisting of aromatic hydrocarbons, aliphatic hydrocarbons, chlorinated hydrocarbons, esters of hydrocarbons and ketones of hydrocarbons, said organic inert solvent being mixed in such a manner that the viscosity of the thus-diluted impregnant is below 500 cps.

4,419,262
PYRIDAZINES

Martin Petrzilka, Kaiseraugst, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

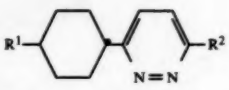
Filed Jul. 12, 1982, Ser. No. 396,998

Claims priority, application Switzerland, May 14, 1982, 3014/82

Int. Cl.³ C09K *3/34;* **C02F** *1/13;* **C07D** *237/08, 237/02*

U.S. Cl. 252—299.61 **15 Claims**

1. A compound of the formula



I

wherein R^1 is straight-chain alkyl of 1 to 12 carbon atoms, R^2 is 1-alkynyl and said 1-alkynyl group in R^2 is a straight-chain group of 2 to 10 carbon atoms.

4,419,263
LIQUID CRYSTALLINE CYCLOHEXYLCARBONITRILE DERIVATIVES

Klaus Praefcke; Dietmar Schmidt, both of Berlin, and Rudolf Eidenschink, Dieburg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

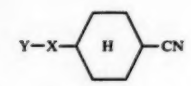
Filed Jan. 7, 1982, Ser. No. 337,805

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1981, 3100142

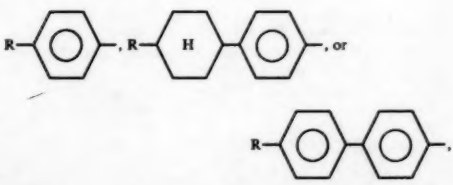
Int. Cl.³ C09K *3/34;* **G02F** *1/13;* **C07C** *121/46, 121/66, 120/00, 120/04*

U.S. Cl. 252—299.63 **20 Claims**

1. A cyclohexylcarbonitrile derivative of the formula

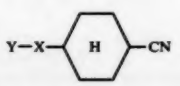


wherein Y is

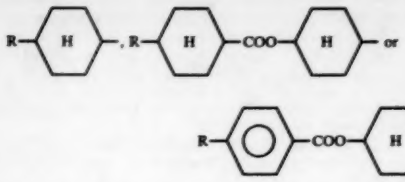


X is —COO—, —O—CO, —CH_2O—, —OCH_2— or —CH_2CH_2—, and R is alkyl or alkoxy each of 1–12 carbon atoms; and all cyclohexyl rings are trans.

6. A cyclohexylcarbonitrile derivative of the formula

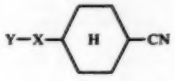


wherein Y is

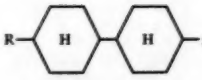


X is $-CH_2CH_2-$, and R is alkyl or alkoxy each of 1–12 carbon atoms; and all cyclohexyl rings are trans.

7. A cyclohexylcarbonitrile derivative of the formula



wherein Y is



X is —COO—, —O—CO or $-CH_2CH_2$, and R is alkyl or alkoxy each of 1–12 carbon atoms; and all cyclohexyl rings are trans.

4,419,264

FLUORINE-CONTAINING 4,4'-BIS-(CYCLOHEXYL)-BIPHENYL DERIVATIVES, AND DIELECTRICS AND ELECTRO-OPTICAL DISPLAY ELEMENTS CONTAINING THEM

Rudolf Eidenschink, Dieburg; Michael Römer, Rodgau, and Ludwig Pohl, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

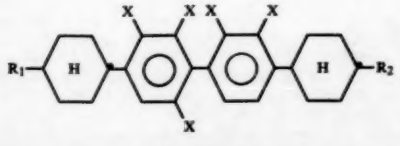
Filed Apr. 30, 1982, Ser. No. 373,454

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 3117152

Int. Cl.³ G02F 1/133; C09K 3/34; C07C 25/18, 43/184, 43/142

U.S. Cl. 252—299.63 **10 Claims**

1. A compound of the formula



wherein R_1 and R_2 are identical or different and each is alkyl or alkoxy each of up to 8 C atoms, and one or two of the substituents X are fluorine and the others are hydrogen.

4,419,265

ADDITION PRODUCTS FROM ETHYLENE OXIDE-PROPYLENE OXIDE BLOCK POLYMERS AND BIS-GLYCIDYL ETHERS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Helmut Diery, Kelkheim, and Martin Hille, Liederbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

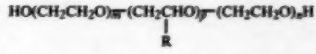
Filed Dec. 21, 1981, Ser. No. 332,971

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049455

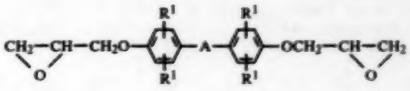
Int. Cl.³ B01D 17/04; C08L 63/00

U.S. Cl. 252—331 **4 Claims**

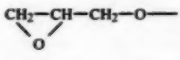
1. An addition product from the components consisting essentially of (a) an ethylene oxide-propylene oxide block polymer of the formula

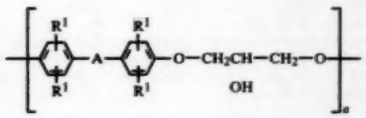


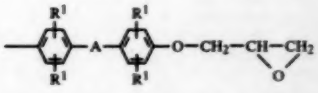
wherein R denotes methyl or ethyl, n and m are numbers which are so chosen that the content of polyethylene oxide constitutes 5 to 80% of the molecular weight of the total molecule and p is a number larger than 10, and (b) a bis-glycidyl ether of the formula



or







wherein the R^1's can be identical or different and denote hydrogen, C_1–C_4-alkyl or halogen, A denotes a direct bond, a sulfonyl or cyclohexyl group or a group of the formula

R^2 denotes hydrogen, methyl or phenyl and a denotes an integer from 0 to 10.

4,419,266

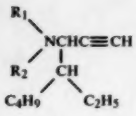
CORROSION INHIBITORS CONTAINING 3-DIALKYL-3-(1-ETHYLPENTYL)-PROP-1-YNE

Eugene V. Hort, Wayne; Lowell R. Anderson, Morristown, and Dru W. Alwani, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,295
Int. Cl.³ C23F 11/14
U.S. Cl. 252—392 18 Claims

1. An aqueous composition for inhibiting the corrosion of metals placed therein comprising:

(a) an effective amount of a corrosion-inhibiting compound having the formula:



where R_1 and R_2 are independently alkyl C_1–C_6, or phenyl; and

(b) a non-oxidizing acid.

9. A corrosion inhibitor for aqueous solutions of mineral acids consisting essentially of the reaction product obtained by the catalytic ethynylation of a secondary amine R_1R_2NH, where R_1 and R_2 are independently alkyl C_1–C_6 or phenyl, and 2-ethylhexanal, with acetylene.

4,419,267

PROCESS FOR REGENERATING ANTIMONY CONTAINING OXIDE CATALYST COMPRISING AN AQUEOUS AMMONIA IMPREGNATION

Yutaka Sasaki; Kunio Mori, both of Yokohama; Kiyoshi Moriya, Kanagawa, and Hiroshi Utsumi, Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,271
Claims priority, application Japan, May 23, 1980, 55-67872
Int. Cl.³ B01J 27/30, 23/92; C07C 120/14, 11/12
U.S. Cl. 502—26 7 Claims

1. A process for regenerating an antimony containing metal oxide catalyst which comprises

impregnating aqueous ammonia in an amount corresponding to the pore volume of the catalyst, into a metal oxide catalyst whose activity has been deteriorated, said catalyst containing as essential components (A) antimony, (B) at least one element selected from the group consisting of iron, cobalt, nickel, manganese, uranium, cerium, tin and copper, (C) at least one element selected from the group consisting of vanadium, molybdenum and tungsten and (D) tellurium,

drying the catalyst, and

calcining the catalyst in a non-reducing atmosphere at a temperature in the range of about 550° C. to about 950° C.

2. The process according to claim 1, wherein the antimony containing metal oxide catalyst is a metal oxide catalyst containing, in addition to said components (A) to (D), (E) at least one element selected from the group consisting of magnesium, calcium, strontium, barium, lanthanum, titanium, zirconium, niobium, tantalum, chromium, rhenium, ruthenium, osmium, rhodium, iridium, palladium, platinum, silver, zinc, cadmium, boron, aluminum, sodium, potassium, rubidium, cesium, indium, thallium, silicon, germanium, lead, phosphorus, arsenic, bismuth, sulfur and selenium.

3. The process according to claim 2, wherein the antimony containing metal oxide catalyst is a metal oxide catalyst having the empirical formula

$$Me_aSb_bX_cTe_dQ_eO_f$$

where Me represents at least one element selected from the group consisting of Fe, Co, Ni, Mn, U, Ce, Sn and Cu, X represents at least one element selected from the group consisting of V, Mo and W, and Q represents at least one element selected from the group consisting of Mg, Ca, Sr, Ba, La, Ti, Zr, Nb, Ta, Cr, Re, Ru, Os, Rh, Ir, Pd, Pt, Ag, Zn, Cd, B, Al, Na, K, Rb, Cs, In, Tl, Si, Ge, Pb, P, As, Bi, S and Se; and a, b, c, d, e and f represent each atomic ratios, wherein, when a = 10, b = 5–60, c = 0.01–5, d = 0.02–10, e = 0–20 and f = the number of oxygen atoms corresponding to the oxide thereof.

4,419,268

PARTIALLY HYDROLYZED SILICATE TREATMENT OF CATALYST SUPPORT

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 20, 1981, Ser. No. 323,854
Int. Cl.³ C08F 4/24, 4/02; B01J 31/02, 31/34
U.S. Cl. 502—158 14 Claims

1. A process for producing a catalyst comprising combining a silica organosol produced by the partial hydrolysis of a silicate ester to give an organosilicon compound having a plurality of silicon atoms per molecule with a support selected from a silica-containing material which is 80–100 weight percent silica or an aluminium phosphate to form a catalyst base, said base containing in addition a chromium compound.

2. A method according to claim 1 wherein said support is said silica-containing material.

4. A method according to claim 2 wherein said silica organosol is produced from a silicon tetrahydrocarbyloxide of the formula $Si(OR)_4$ where R is a hydrocarbyl radical containing from 1 to about 12 carbon atoms selected from alkyl, cycloalkyl, aryl, and combinations thereof, said R groups being alike or different.

4,419,269

TRANSITION METAL CONTAINING CATALYST

Joseph G. Schell, Jr., Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 6, 1982, Ser. No. 447,385
Int. Cl.³ C08F 4/64
U.S. Cl. 502—169 3 Claims

1. A catalyst useful in the preparation of stereospecific polymer of one or more α-olefins having at least three carbon atoms which is a titanium-containing catalyst prepared by

(A) reacting in the presence of an inert hydrocarbon diluent

(1) the reaction product of

(a) an organomagnesium compound;

(b) water, carbon dioxide or an organic oxygen-containing compound; and

(c) an electron donor or Lewis base; and

(2) a transition metal, Tm, halide;

(B) recovering and washing the resultant solid reaction product with an inert hydrocarbon;

(C) reacting the washed solid product from (B) with, in the order indicated,

(1) titanium tetrachloride and

(2) a reducing agent;

(D) stirring the mixture until the resultant brown β-crystalline form of titanium trichloride is transformed into the violet α-crystalline form;

(E) recovering and washing the resultant solid catalyst with an inert hydrocarbon;

and wherein the components are employed in quantities so as to provide a sufficient quantity of component (A-1-b) to lower the amount of hydrocarbyl groups present in component (A-1-a) such that the resultant product will not substantially reduce $TiCl_4$ at 25° C. Component (A-1-c) is employed in quantity which provides a final atomic ratio of electron donor:total combined transition metal in components (A-2) and (C1) of from about 0.05:1 to about 50:1; at least a sufficient amont of halogen from component (A-2) is employed to convert essentially all of the groups attached to a magnesium atom in component (A-1) to halide groups. The quantity of component (C-1) is that which is sufficient to provide a Ti from component (C-1):Mg atomic ratio of from about 0.01:1 to about 100:1; and

the quantity of component (C-2) is employed so as to only reduce a portion of the titanium tetrachloride so as to provide a final atomic ratio in the solid washed product of Ti:Mg of 0.02:1 to about 20:1.

4,419,270
OXIDATION CATALYST

Michio Ueshima, Nishinomiya; Yoshiyuki Takahashi, Suita; Ritsuo Kitada, Takatsuki, and Isao Nagai, Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Filed Jun. 19, 1981, Ser. No. 275,243
Claims priority, application Japan, Jun. 26, 1980, 55-85919; Apr. 16, 1981, 56-56238; Apr. 17, 1981, 56-56906; Apr. 22, 1981, 56-59782; Apr. 24, 1981, 56-61405
Int. Cl.³ B01J 23/22, 23/28, 27/18
U.S. Cl. 502—209 2 Claims

1. A catalyst for the vapor-phase oxidation of an unsaturated hydrocarbon, alcohol, saturated aliphatic aldehyde or unsaturated aliphatic aldehyde having 4 carbon atoms, said catalyst comprising molybdovanadophosphoric acid and being formed by adding a nitrogen-containing heterocyclic compound selected from the group consisting of pyridine, piperidine and piperazine to an aqueous solution of molybdovanado-phosphoric acid to form a precipitate, pelletizing, drying and calcining and has X-ray diffraction lines (Cu-K_α radiation) at $2\theta =$ about 26.2°, about 10.5°, about 21.3° and about 30.3° and a crystal structure approximating that of its salt, and said catalyst having the composition represented by the general formula

$$P_aMo_bV_cX_dY_eO_f$$

wherein the dissociable protons of the molybdovanadophosphoric acid are omitted, X represents at least one element selected from the group consisting of sodium, potassium, rubidium, cesium, thallium, beryllium, magnesium, calcium, strontium, and barium, Y represents at least one element selected from the group consisting of copper, silver, arsenic, antimony, tellurium, cobalt, bismuth and zirconium, and the subscripts a to f represent the atomic proportions of the respective elements, provided that when b is 12,

a is 0.1–3.0,
c is 0.1–6.0
d is 0–10.0
e is 0–5.0, and
f is a value determined by the atomic valences and atomic proportions of the respective elements.

4,419,271
HYDROCARBON CONVERSION CATALYST

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 15, 1979, Ser. No. 84,761
Int. Cl.³ B01J 29/08
U.S. Cl. 502—65 37 Claims

1. A composition of matter useful as a catalyst base for supporting active hydrogenation metal components or for catalyzing acid catalyzed hydrocarbon conversion reactions comprising in intimate heterogeneous mixture (1) a modified hydrogen crystalline aluminosilicate Y zeolite having activity for catalytically cracking hydrocarbons and having a unit cell size between 24.25 and 24.35 Å and a water absorption capacity, at 4.6 mm water vapor partial pressure and 25° C., less than 8% by weight of the zeolite and (2) a dispersion of silica-alumina in a gamma alumina matrix.

4,419,272
CATALYSTS FOR THE PRODUCTION OF 2-CYANOPYRAZINE

Bergstein Wolfgang, Rodenbach; Heinz Friedrich, Hanau; Axel Kleemann, Hanau; Günther Prescher, Hanau, and Helmut Beschke, Hanau, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Feb. 23, 1982, Ser. No. 351,404
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107756
Int. Cl.³ B01J 21/16, 23/16
U.S. Cl. 502—84 9 Claims

1. A composition suitable to catalyze the reaction of 2-methylpyrazine with ammonia and oxygen to form 2-cyanopyrazine consisting essentially of the elements antimony, vanadium and oxygen and additionally at least one of the elements iron, copper, titanium, cobalt, manganese, and nickel where the atomic ratio of antimony to vanadium is greater than 1 and which contains in addition to these compounds a lattice layer silicate and highly dispersed silica and which has a BET surface area of 5 to 50 m^2/g, a macropore volume of 0.1 to 0.8 cm^3/g, and an average pore radius of 1 to 8×10^{-7} cm.

4,419,273
CLAY-BASED SULFUR SORBENT

Donald S. Santilli, Pinole, Calif., and Donald W. Blakely, deceased, late of Oakland, Calif. (by Robert L. Jacobson, administrator), assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 4, 1981, Ser. No. 318,228
Int. Cl.³ B01J 21/16, 23/72
U.S. Cl. 502—80 8 Claims

1. A sulfur sorbent comprising a support made from fibrous silicate clay with randomly dispersed fibers and at least enough copper-containing compound to provide a sorbent of at least 25 weight percent copper measured as the reduced metal.

4. The sulfur sorbent of claim 1 wherein said sulfur sorbent contains from 1 to 50 weight percent alumina.

4,419,274
NONMETALLIC CATALYST COMPOSITIONS FOR OXIDATION OF AMMONIA AND PROCESS FOR MAKING THE CATALYST

Yoon K. Sin, Seoul, and Daiuk Kim, Young Il-Koon, both of Rep. of Korea, assignors to Pohang Iron & Steel Co., Ltd., Pohang City, Rep. of Korea

Filed Dec. 15, 1981, Ser. No. 331,216
Claims priority, application Rep. of Korea, Dec. 16, 1980, 4781
Int. Cl.³ B01J 21/04, 23/10, 23/78, 23/84
U.S. Cl. 502—304 18 Claims

1. A nonmetallic catalyst composition of the formula

$$a\ Fe_2O_3—MAl_2O_4—b\ Bi_2O_3—c\ Ce_2O_3$$

wherein

MAl_2O_4 is a spinel carrier,
M is magnesium, manganese, calcium, strontium or barium,
a is from 10 to 40 weight percent,
b is from 3.5 to 6 weight percent, and
c is from 0.5 to 2 weight percent,

all percentages being based on the spinel.

4,419,275
METHOD OF HYDROREFINING CATALYST MANUFACTURE

Shin-ichi Yoshida; Takemitu Yano, and Hidehiro Higashi, all of Kitakyushu, Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 421,764
Claims priority, application Japan, Jun. 29, 1982, 57-112311
Int. Cl.³ B01J *21/04, 23/85*
U.S. Cl. 502—322 **5 Claims**

1. A method of manufacturing a hydrorefining catalyst of an alumina carrier material and hydrogenating metal components deposited thereon which comprises controlling a water of hydration of pseudo-boehmite contained in an amorphous alumina hydrate slurry in the range of 1.20–1.50 mols per mol of Al_2O_3; forming an alumina hydrate obtained from this slurry into alumina particles of desired shape and dimensions and drying; then calcinating the alumina particles in an atmosphere containing steam to thereby prepare a porous alumina carrier material; and depositing hydrogenating metal components on this porous alumina carrier material.

4,419,276
SILVER CATALYST FOR THE MANUFACTURE OF ETHYLENE OXIDE AND A PROCESS FOR PREPARING THE CATALYST

Madan M. Bhasin, Charleston, and Glenn H. Warner, St. Albans, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1981, Ser. No. 307,242
Int. Cl.³ B01J *23/04, 23/66*
U.S. Cl. 502—347 **14 Claims**

1. A process for preparing a supported silver catalyst for the production of ethylene oxide by the vapor phase oxidation of ethylene with an oxygen-containing gas comprising:

(a) impregnating a porous catalyst support with a solution comprising a solvent or a solubilizing agent, and silver salt in an amount sufficient to deposit the desired amount of silver on said support;

(b) treating the impregnated support to convert at least a fraction of the silver salt to silver metal and effect deposition of silver on the surface of said support;

(c) impregnating the support treated in step (b) with a compound of at least one metal cation promoter in an amount sufficient to deposit the desired amount of promoter on said support dissolved in an organic solvent in which water is soluble at ambient temperature in an amount no greater than about 50 wt. % based on the weight of water-solvent solution; and

(d) treating the impregnated support produced in step (c) to effect deposition of said promoter on the surface of said support.

4,419,277
TREATED POLYACETYLENE

Robert M. Myers, Holland, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 23, 1981, Ser. No. 246,535
Int. Cl.³ H01B *1/02*
U.S. Cl. 252—500 **27 Claims**

1. A process for reducing doped polyacetylene crosslinking and embrittlement comprising treating said polyacetylene with a material selected from the class consisting of:

(a) hindered phenols having at least one alkyl or alkoxy group of from about 4 to about 12 carbon atoms, said alkyl or alkoxy group being in a position ortho and/or para to the hydroxy group on the benzene ring;

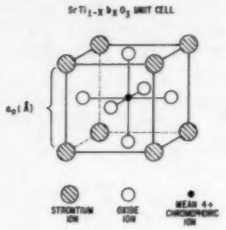
(b) alkyl ethers of hydroquinone, wherein said alkyl group has from 1 to about 12 carbon atoms; and

(c) dialkyl thiodipropionates wherein each of said alkyl groups has from 1 to about 18 carbon atoms and each alkyl group may be the same or different; and mixtures thereof.

4,419,278
PHOTOACTIVE SEMICONDUCTOR MATERIAL USING TRUE SOLID/SOLID SOLUTION MIXED METAL OXIDE

Arnold Z. Gordon, Lyndhurst, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed May 4, 1981, Ser. No. 259,941
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—501.1 **30 Claims**



1. A photoactive true solid/solid solution semiconductor mixed metal material having a band gap of about 1.4 eV containing metal components all of which are derived from precursor substances selected from the group consisting of elemental metals, non-oxide metal compounds, and mixtures thereof; said mixed metal oxide material corresponding to the formula $A_r^{va}M_y^{vm}O_z^{-2}$; where said formula represents the stoichiometry of the basic repeating unit lattice cell; where M is the combination of component (a) metal and component (b) metal; A when present is at least one different metal which does not substantially alter the optical absorption accruing from M in the above formula; O represents oxygen, said formula being further characterized in the r, y, z, va and vm are defined by the relationship va(r)+vm(y)=2z, wherein r equals a value of from 0 to 2, inclusive, y is from 1 to 2, inclusive, z is from 1 to 7, inclusive, va equals the positive valence of A, vm equals the positive mean valence of M and the valence of oxygen is −2; and wherein all said metal components of said formula are selected from the group consisting of boron, aluminum, tin, lead, the transition metals of families 1b through 7b, inclusive, and 8 of the periodic table of elements, and the lanthanide series; wherein M in the above formula comprises:

(a) 50 to 99.9 mole percent, based on the total metals mole fraction, of one or more component (a) metals; and

(b) 0.1 to 50 mole percent, based on the total metals mole fraction, of one or more component (b) metals;

with the proviso that said component (b) metals arwe different than said component (a) metals, and with the further proviso that said component (a) metals, when in comparable oxide form, have a larger band gap than said component (b) metals, when said component (b) metals are in their comparable oxide form.

4,419,279
CONDUCTIVE PASTE, ELECTROCONDUCTIVE BODY AND FABRICATION OF SAME

John C. Abrams, Tappan, N.Y., assignor to Potters Industries, Inc., Hasbrouck Heights, N.J.

Filed Sep. 15, 1980, Ser. No. 187,428
Int. Cl.³ H01B *1/02*
U.S. Cl. 252—514 **16 Claims**

1. A conductive paste suitable for forming an electroconductive body, which comprises inorganic non-metallic particles coated with silver, said silver-coated inorganic non-metallic particles being of a size, on average, of from 1 to 100 microns in maximum dimension, and silver particles, in an polymeric organic binder formable into a matrix having embedded therein said silver-coated inorganic non-metallic particles and silver particles, the total amount of silver in said paste consti-

tuting at least 10% by weight of the paste and the amount of silver in said silver particles constituting at least 5% by weight of the paste.

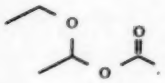
4,419,280

1-ETHOXY-1-ETHANOL ACETATE AND USES THEREOF FOR AUGMENTING OR ENHANCING AROMA OR TASTE OF CONSUMABLE MATERIALS

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 176,111, Aug. 7, 1980, Pat. No. 4,296,131.
This application Jul. 6, 1981, Ser. No. 280,277
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.
Int. Cl.³ A61K 7/46
U.S. Cl. 252—522 R 2 Claims

1. A process for augmenting or enhancing the aroma of a perfume composition or cologne comprising adding to a perfume composition; or cologne base, an organoleptic property-modifying, augmenting or enhancing quantity of 1-ethoxy-1-ethanol acetate having the structure:



4,419,281

N,N-DIETHYLHEPTANAMIDE FRAGRANCES

Claude Breant, Villeurbanne, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Sep. 15, 1981, Ser. No. 302,672
Claims priority, application France, Sep. 26, 1980, 80 20985
Int. Cl.³ A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 15 Claims

1. In a perfumed composition containing an admixture of perfume ingredients, the improvement which comprises, as an odorant therefor, an effective fragrance imparting amount of N,N-diethylheptanamide.

4,419,282

N,N-DIMETHYLOCTANAMIDE FRAGRANCES

Claude Breant, Villeurbanne, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Sep. 15, 1981, Ser. No. 302,673
Claims priority, application France, Sep. 26, 1980, 80 20984
Int. Cl.³ A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 16 Claims

1. In a perfumed composition, the improvement which comprises, as an odorant therefor, an effective fragrance imparting amount of N,N-dimethyloctanamide.

4,419,283

LIQUID COMPOSITIONS FOR DISPLAY DEVICES

Ronald A. Schneider, 555 Pierce St., #303, Albany, Calif. 94706

Continuation-in-part of Ser. No. 105,967, Dec. 21, 1979, abandoned, and Ser. No. 105,966, Dec. 21, 1979, abandoned.
This application Jul. 20, 1981, Ser. No. 284,622
Int. Cl.³ G09F 19/00
U.S. Cl. 252—600 28 Claims

1. In a display device which depends on the movement of a plurality of mutually immiscible liquids, the combination thereof with a composition comprising at least four mutually immiscible liquids, three of which are composed primarily of organic substances the molecules of which contain at least 3 hydrogen atoms and do not attain fluorine, and the fourth of which comprises water.

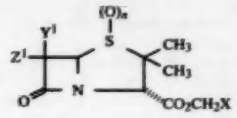
4,419,284

PREPARATION OF HALOMETHYL ESTERS (AND RELATED ESTERS) OF PENICILLANIC ACID 1,1-DIOXIDE

Thomas C. Crawford, Gales Ferry, and Vytautas J. Jasys, New London, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,453
Int. Cl.³ C07D 499/00; A61K 31/425
U.S. Cl. 260—245.2 R 8 Claims

1. A compound of the formula



wherein X is Cl, Br, I or OSO_2R^1 where R^1 is alkyl having from one to six carbon atoms or $C_6H_4R^2$ where R^2 is H, Cl, Br, I, NO_2 or alkyl or alkoxy having from one to three carbon atoms; n is zero, 1 or 2; Y^1 is H and Z^1 is C=N— or SCN—, or Y^1 is $SeC_6H_4R^2$ and Z^1 is Cl or Br, R^2 is H, Cl, Br, I, NO_2 or alkyl or alkoxy having from one to three carbon atoms.

4,419,285

AZIDO FLUORODINITRO AMINES

Milton B. Frankel, Tarzana, and Edward F. Witucki, Van Nuys, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 19, 1982, Ser. No. 350,494
Int. Cl.³ C07C 117/00
U.S. Cl. 260—349 2 Claims

1. The compound, azidomethyl bis(fluorodinitroethyl) amine.

4,419,286

AZIDO ESTERS

Edward F. Witucki, Van Nuys, and Joseph E. Flanagan, Woodland Hills, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 21, 1982, Ser. No. 370,235
Int. Cl.³ C07C 117/00
U.S. Cl. 260—349 1 Claim

1. The compound, 6-azidohexyl-6-azidohexanoate.

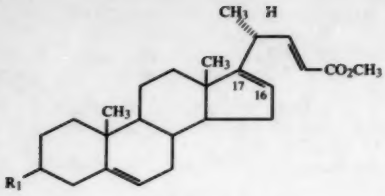
4,419,287

STEREOCONTROLLED SYNTHESIS OF STEROIDAL SIDE CHAINS

William G. Dauben, and Todd E. Brookhart, both of Berkeley, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 216,959, Dec. 16, 1980, abandoned.
This application May 24, 1982, Ser. No. 381,171
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.1 8 Claims

1. A compound having the structure



wherein R_1 is —OH or —OCCH$_3$ (with O)

4,419,288

ELASTIN HYDROLYZATE

Gheorghe Cioca, Coatesville, Pa., assignor to Seton Company, Newark, N.J.

Continuation-in-part of Ser. No. 296,985, Aug. 27, 1981, Pat. No. 4,363,760. This application Aug. 23, 1982, Ser. No. 409,316
Int. Cl.[3] A23J *1/10*; C07G *7/06*; C08L *89/04, 89.06*
U.S. Cl. 260—123.7 3 Claims

1. A soluble elastin partial hydrolyzate comprised of polypeptides having from 3 to 4 desmosine and isodesmosine residues/1,000 residues.

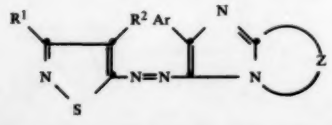
4,419,289

ISOTHIAZOLE TYPE AZO DYES CONTAINING IMIDAZO TYPE COUPLERS

Jean C. Fleischer; Gary T. Clark, and Max A. Weaver, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 128,209, Mar. 7, 1980, Pat. No. 4,354,970. This application Mar. 11, 1982, Ser. No. 356,991
Int. Cl.[3] C09B *29/039, 29/36, 29/46, 29/48*
U.S. Cl. 260—158 4 Claims

1. A compound having the formula



wherein R^1 and R^2 are each selected from cyano, bromo, hydrogen, chloro, formyl, lower alkoxycarbonyl, lower alkyl, lower alkylsulfonyl, thiocyano, carbamoyl, lower alkylcarbamoyl, and lower alkanoyl; Z represents the atoms necessary to complete a fixe or six membered ring which is unsubstituted or substituted with nitrogen, oxygen, sulfur or a combination thereof; and Ar is a benzene ring which is unsubstituted or substituted with up to three of lower alkyl, lower alkoxy, halogen, hydroxy, lower alkylamino, nitro or cyano.

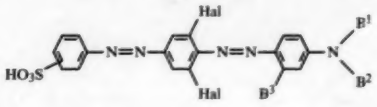
4,419,290

DIAZO DYES HAVING A COUPLER COMPONENT ATTACHED TO A SULFAPHENYL-AZO-PHENYL-AZO-RADICAL

Johannes Dehnert, Ludwigshafen, and Hermann Loeffler, Speyer, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Continuation of Ser. No. 896,383, Apr. 14, 1978. This application Jun. 16, 1980, Ser. No. 159,474
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718620
Int. Cl.[3] C09B *31/043, 31/062, 31/068, 31/14*
U.S. Cl. 260—186 2 Claims

1. A disazo dye having the formula:



wherein

Hal is chlorine or bromine;

B^1 is hydrogen, C_1 or C_4 alkyl, C_2 or C_3 hydroxyalkyl, allyl, C_2 and C_3 alkyl substituted by C_1 to C_4 alkoxy or C_1 or C_4 alkanoyloxy, β-cyanoethyl, β-chloroethyl or β-hydroxy-γ-chloropropyl;

B^2 is the same as B^1 or is cyclohexyl, benzyl, sulfobenzyl, phenylethyl, sulfophenylethyl, phenyl or sulfophenyl; and

B^3 is hydrogen, chloro, methyl or C_1 to C_4 alkanoylamino.

4,419,291

PROCESS FOR THE DIRECTED INTERESTERIFICATION OF A TRIGLYCERIDE OIL OR OIL MIXTURE AND TRIGLYCERIDE OILS OR OIL MIXTURE THUS INTERESTERIFIED

Rene De Lathauwer, Herent; Martin Van Opstal, and Albert J. Dijkstra, both of Izegem, all of Belgium, assignors to Safinco, Belgium

Continuation of Ser. No. 74,474, Sep. 11, 1979, Pat. No. 4,284,578. This application Apr. 29, 1981, Ser. No. 258,794
Claims priority, application Belgium, Sep. 14, 1978, 870481
The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.
Int. Cl.[3] C11C *3/02*
U.S. Cl. 260—410.7 10 Claims

1. Process for the directed interesterification of a triglyceride oil or oil mixture which comprises:

(a) adding a low temperature-active interesterification catalyst to the triglyceride oil or oil mixture;

(b) activating the interesterification catalyst at the temperature at which the catalyst is added to the triglyceride oil or oil mixture;

(c) cooling the triglyceride oil or oil mixture containing activated interesterification catalyst to a preselected upper cycle temperature, said temperature being above the reference cloud point temperature of the triglyceride oil or oil mixture;

(d) carrying out a first temperature and time regulated cycle, taking 20 minutes or less wherein, in sequence:

(i) the temperature of the triglyceride oil or oil mixture is rapidly reduced from the upper cycle temperature to the reference cloud point temperature or a preselected lower cycle temperature, said lower cycle temperature being below the reference cloud point temperature; and,

(ii) if the temperature of the triglyceride oil or oil mixture is below the reference cloud point temperature, the temperature of the triglyceride mixture is increased to the reference cloud point temperature;

(e) carrying out at least three successive temperature and time regulated cycles with each such cycle taking 120 minutes or less wherein, in sequence:

(i) the temperature of the triglyceride oil or oil mixture is increased from the reference cloud point temperature to the upper cycle temperature;
(ii) the temperature of the triglyceride oil or oil mixture is rapidly reduced from the upper cycle temperature to the lower cycle temperature; and
(iii) the temperature of the triglyceride oil or oil mixture is increased from the lower cycle temperature to the reference cloud point temperature.

4,419,292

PROCESS FOR PRODUCING POLYCONDENSATES OF ω-OXYPENTADECANOIC ACID

Tohr Yamanaka, Kamakura, and Takashi Imai, Hiratsuka, both of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1982, Ser. No. 339,230
Claims priority, application Japan, Jan. 13, 1981, 56-2629
Int. Cl.³ C11C *3/02*
U.S. Cl. 260—410.9 R **10 Claims**

1. A process for producing polycondensates of ω-oxypentadecanoic acid comprising hydrogenolysis of 2-tetrahydrofuran-undecanoic acid or an ester thereof using a mixed catalyst composed of a catalyst for hydrogenation comprising one or more metals of Group VIII of the Periodic Table, copper-chromium, or copper-zinc, and a solid acid catalyst, by heating under pressure with hydrogen.

4,419,293

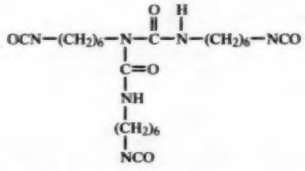
ALIPHATIC SOLVENT COMPATIBLE ISOCYANATES

George A. Hudson, deceased, late of Venetia, Pa. (by Richard L. White, administrator), and Helmut F. Reiff, Leverkusen, Fed. Rep. of Germany, assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 10, 1981, Ser. No. 282,206
Int. Cl.³ C07C *127/24*
U.S. Cl. 260—453 AB **5 Claims**

1. A modified polyisocyanate having improved compatibility with aliphatic hydrocarbon solvents comprising the reaction product of

(a) an aliphatic biuret isocyanate having the formula



and

(b) about 0.05 to 0.5 mols per equivalent of isocyanate of an aliphatic monohydroxy alcohol having between 14 and 30 carbon atoms.

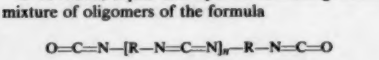
4,419,294

CARBODIIMIDE OLIGOMERS OF TERTIARY ALIPHATIC ISOCYANATES

Allan M. Feldman, Norwalk, and Peter S. Forgione, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 8, 1982, Ser. No. 355,820
Int. Cl.³ C07C *119/055*
U.S. Cl. 260—453 A **9 Claims**

1. A stable, liquid diisocyanate consisting essentially of a mixture of oligomers of the formula



wherein n is an integer from 1 to 10 and R represents a divalent hydrocarbon group having tertiary terminal carbon atoms.

5. A method for producing diisocyanate oligomers having carbodiimide linkages which comprises polymerizing a tertiary aliphatic diisocyanate in the presence of a volatile catalyst and at a temperature effective to produce such oligomers and carbondioxide while monitoring the amount of monomer, and separating the oligomers from catalyst and unreacted monomer at a predetermined minimum level of unreacted monomer.

4,419,295

CONTINUOUS PROCESS FOR THE PRODUCTION OF ORGANIC ISOCYANATES

Hans-Joachim Hennig, Leverkusen, Jürgen Lahrs, Cologne, and Dietrich Liebsch, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 379,822
Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121036
Int. Cl.³ C07C *118/02*
U.S. Cl. 260—453 PH **9 Claims**

1. A continuous process for the production of an isocyanate comprising:

(a) continuously combining a solution of a primary amine in an inert organic solvent with an excess of phosgene dissolved in an inert organic solvent in a mixing chamber at elevated temperature and pressure in a manner such that a less than stoichiometric quantity of amine is sprayed into the phosgene solution by means of at least one smooth jet nozzle having an internal diameter of from 0.01 to 30 mm and that a pressure differential of at least 0.5 bar is maintained; and

(b) continuously separating the components of the solution leaving the mixing chamber.

4,419,296

PREPARATION OF TERTIARY ALKYL CYANIDES

Manfred T. Reetz, and Ioannis Chatziiosifidis, both of Marburg, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 2, 1982, Ser. No. 353,986
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1981, 3115976
Int. Cl.³ C07C *120/04*
U.S. Cl. 260—464 **12 Claims**

1. A process for the preparation of a tertiary alkyl cyanide of the formula

in which

R^1, R^2 and R^3 each independently is an alkyl group or, together with the tertiary carbon atom to which they are bonded, form a polycycloalkyl group, or

R^1 and R^2, together with the tertiary carbon atoms to which they are bonded, form a cycloalkyl group or a bicycloalkyl group,

comprising reacting a tertiary alkyl halide of the formula

in which

X is a chlorine, bromine or iodine atom, with trimethylsilyl

cyanide of the formula $(CH_3)_3SiCN$ in the presence of a Lewis acid selected from the group consisting of $SnCl_4$, $TiCl_4$ and $BiCl_3$.

4,419,297

PREPARATION OF NITRILES FROM FORMAMIDES

Dieter Arlt, Cologne, and Gerhard Klein, Monheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 20, 1982, Ser. No. 340,902

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 3105452

Int. Cl.³ C07C *120/00, 120/10*

U.S. Cl. 260—465.2 **8 Claims**

1. A process for the production of a nitrile of the formula

R—CN

in which R is an aliphatic hydrocarbon radical having up to 17 carbon atoms, any carbon atoms or a multiple which may be present, not being bonded directly to the nitrile group or is an araliphatic or aromatic hydrocarbon radical in each case having up to 12 carbon atoms, comprising reacting an N-substituted formamide of the formula

R—NH—CHO

with at least the stoichiometric quantity of an acylating agent in gas phase at a temperature from about 250° C. to 500° C. in the absence of a catalyst, the acylating agent being selected from the group consisting of acetic anhydride, ketene and the anhydride of the acid corresponding to the desired nitrile.

4,419,298

ETHANOLAMINE SALTS OF DI-PERFLUOROALKYL GROUP CONTAINING ACIDS

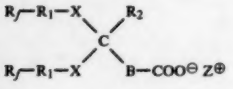
Robert A. Falk, New City; Istvan Borsodi, Yonkers, both of N.Y., and Dieter Reinehr, Kandern, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 12, 1981, Ser. No. 292,326

Int. Cl.³ C07C *53/18*

U.S. Cl. 260—501.16 **4 Claims**

1. A compound of the formula



wherein

R_f is perfluoroalkyl of 6 to 14 carbon atoms;

R_1 is straight or branched chain alkylene of 2 to 8 carbon atoms;

X is —S— or $—SO_2—$;

R_2 is hydrogen or alkyl of 1 to 4 carbon atoms;

B is a covalent bond or alkylene of 1 to 6 carbon atoms; and

Z is the cation of mono-, di-, or tri-ethanolamine.

4,419,299

PHOSPHONOPOLYESTER OLIGOMERS

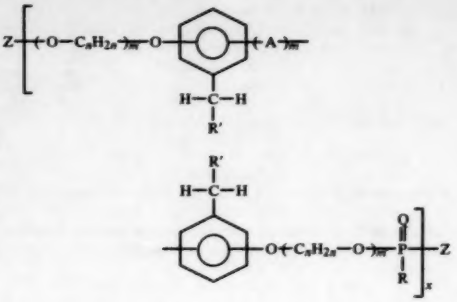
Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Co., Midland, Mich.

Filed Dec. 14, 1981, Ser. No. 330,106

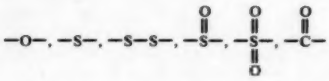
Int. Cl.³ C07F *9/09*

U.S. Cl. 260—929 **3 Claims**

1. An oligomer having recurring units represented by the following general formula



wherein each A is independently



or a divlaent hydrocarbon group having from 1 to about 8 carbon atoms; each Q is independently oxygen or sulfur; each R is independently a hydrocarbon group having from about 1 to about 10 carbon atoms; each R′ is independently a $—CH=CH_2$ group or a $—CXH—CXH_2$ group, wherein X is chlorine or bromine; each Z is independently a moiety such that the terminal groups are hydroxyl or phosphonate groups or combination thereof; each m is independently zero or one; each m′ independently has a value from 1 to about 5; each n independently has a value of 2, 3 or 4; and x has an average value of from 1 to about 10.

4,419,300

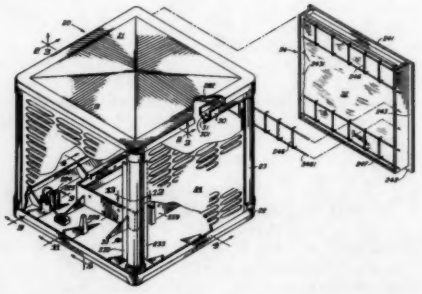
NON-CORROSIVE, NON-STAINING EVAPORATIVE COOLER

David VanNess; Joseph Hines, both of Scottsdale, and William E. Wells, Phoenix, all of Ariz., assignors to General Texas Corporation, Roanoke, Tex.

Continuation of Ser. No. 126,870, Mar. 3, 1980, Pat. No. 4,309,365. This application Dec. 30, 1981, Ser. No. 336,012

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—106 **5 Claims**



5. A non-louvered ventilator panel for an evaporative cooler comprising:

a frame having two substantially parallel vertical sides;

means for removably mounting a cooler pad having a surface on the panel; and

a plurality of stand-off means positioned between the vertical sides of the panel and a surface of a pad mounted

thereon, said stand-off means adapted to contact the surface of a pad substantially horizontally from one side of the panel to the other for positioning a pad for maximum air flow therethrough and for directing water flowing down the surface of a cooler pad into the pad.

4,419,301

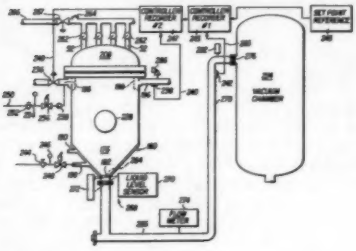
METHOD AND APPARATUS FOR TREATING FLUENT MATERIALS

John E. Nahra, Potomac, and Walter Woods, Silver Spring, both of Md., assignors to Dasi Industries, Inc., Washington, D.C.

Continuation of Ser. No. 83,362, Oct. 10, 1979, Pat. No. 4,310,476, which is a continuation-in-part of Ser. No. 29,391, Apr. 12, 1979, abandoned, which is a continuation of Ser. No. 806,849, Jun. 15, 1977, abandoned. This application Jun. 29, 1981, Ser. No. 277,606

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—118 **10 Claims**



1. A method for maintaining a stable fluid level in a pressurized fluid processing system including a vessel, independent of large changes in system dynamics, comprising the steps of:

establishing a desired flow rate into said system,

permitting said desired flow rate to vary independently of a predetermined fluid level at the bottom of the said vessel,

pressurizing and heating said system to a desired level;

collecting said fluid with said predetermined fluid level at the bottom of said vessel,

setting constant parameters for a continuous flow outlet means for said system whereby said predetermined fluid level is maintained in said system; and

maintaining said setting regardless of said variations in said flow rate into said system.

2. An apparatus for treating fluent material with a heated gas having an initial flow velocity comprising:

a pressure vessel,

dispensing means mounted within said vessel for forming at least one isolated, continuous film of said fluent material,

baffle means mounted within said pressure vessel for reducing said initial flow velocity of said heated gas and for distributing said gas within said vessel to achieve rapid heating of said isolated, continuous film of said fluent material while subjecting said film to minimum of physical perturbation,

fluid outlet means coupled to said vessel for withdrawing treated fluent material therefrom;

holding tube means coupled to said fluid outlet means for maintaining said fluent material at a selected temperature for a selected time interval; and

fluid collecting means within said pressure vessel for intercepting said isolated, continuous film and for supplying said treated fluent material to said outlet means with a minimum of physical agitation; wherein said dispensing means comprises:

a structure forming a chamber for receiving a quantity of said fluent material, said structure having a discharge aperture formed therein; and,

distribution means positioned within said structure for distributing substantially equal quantities of said fluent material to each segment of said discharge aperture; and wherein the cross-sectional areas of said outlet means and holding tube means are fixed so as to provide balanced force control means for maintaining a stable liquid level in said pressure vessel independent of changes in system dynamics.

4,419,302

STEAM GENERATOR

Atsushi Nishino, Neyagawa; Tadashi Suzuki, Katano, and Kazunori Sonetaka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

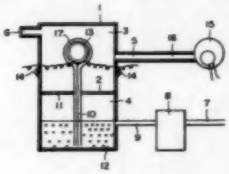
PCT No. PCT/JP80/00223, § 371 Date May 28, 1981, § 102(e) Date May 28, 1981, PCT Pub. No. WO81/00903, PCT Pub. Date Apr. 2, 1981

PCT Filed Sep. 26, 1980, Ser. No. 269,021

Claims priority, application Japan, Sep. 29, 1979, 54-125578; Sep. 29, 1979, 54-125579; Sep. 5, 1980, 55-123809; Sep. 11, 1980, 55-127450

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—142 **16 Claims**



1. A steam generator comprising a container having an upper vaporization chamber and a lower liquid storage chamber, means for partitioning the upper and lower chambers from each other, said vaporization chamber having a gas charge inlet port enabling a gas to be charged into said vaporization chamber and a discharge port for discharging steam generated within said vaporization chamber; a suck-up member disposed to extend into the upper and lower chambers within said container so that one end portion of said suck-up member is immersed in a liquid contained in said lower storage chamber while the other end portion extends into the upper chamber; and heating unit means provided at said other end portion of the suck-up member for heating and vaporizing the liquid absorbed by the suck-up member at the one end portion when it reaches the other end portion of said suck-up member, said heating unit means being in the form of a wire or band and a metal oxide or metallic double oxide layer formed on said wire or band to thereby increase the surface area of the heating unit means in contact with the liquid and improve thermal transmission to vaporize the liquid, said vaporized liquid being entrained by a gas passed through said gas charge port for discharge through said discharge port.

4,419,303

METHOD FOR PRODUCING LARGE DIAMETER HIGH PURITY SODIUM AMALGAM PARTICLES

Scott Anderson, 1116 W. Church, Champaign, Ill. 61820

Continuation-in-part of Ser. No. 118,667, Feb. 5, 1980, which is a continuation-in-part of Ser. No. 70,839, Aug. 29, 1979, Pat. No. 4,238,173, which is a division of Ser. No. 654,416, Feb. 2, 1976, Pat. No. 4,216,178. This application Nov. 17, 1980, Ser. No. 207,628

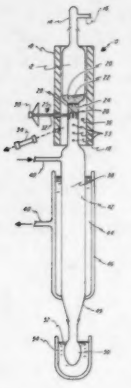
Int. Cl.³ B01J *2/04*

U.S. Cl. 264—9 **27 Claims**

1. A method for producing free-flowing, discrete sodium-amalgam particles of controlled particle size and low sodium oxide content in the range from about 500 microns to about 1300 microns in diameter comprising:

heating a mixture of sodium and mercury in a vessel to form an amalgam melt of determinable unoxidized sodium content;

separating a portion of said melt from the vessel at a point other than at an upper surface of said melt to thereby



control the height of said separated portion above a vibrating discharge conduit and thus the initial velocity of the melt through said vibrating discharge conduit; and

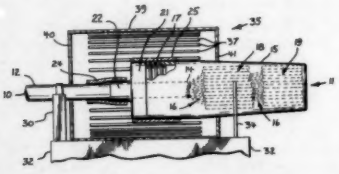
passing the separated portion of said melt through a vibrating discharge conduit into an inert, quenching atmosphere to form particles of said amalgam.

4,419,304

METHOD FOR FORMING SEALS WITH HEAT SHRINKABLE MATERIALS

William H. Ficke, Gwinnett, and Robert N. McIntyre, DeKalb, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 15, 1980, Ser. No. 169,058
Int. Cl.³ B29C *27/02;* B29D *9/00*
U.S. Cl. 264—25 **10 Claims**



1. A method of hermetically sealing a sleeve about a plastic substrate which comprises the steps of:

(a) mounting a heat-shrinkable plastic sleeve having a transmittance of between 50% and 95% to electromagnetic radiation within a selected infrared wavelength band about the plastic substrate; and

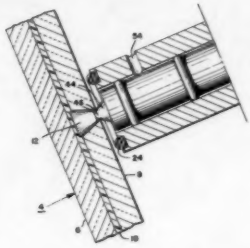
(b) applying electromagnetic radiation within said selected wavelength band to the sleeve for a period of time sufficient to cause the sleeve to shrink upon the substrate and for the interfacing surfaces of the substrate and sleeve to fuse.

4,419,305

METHOD AND APPARATUS FOR WINDSHIELD REPAIR

William B. Matles, Philadelphia, Pa., assignor to Glass Medic, Inc., Line Lexington, Pa.

Filed Dec. 10, 1981, Ser. No. 329,345
Int. Cl.³ B29C *27/00, 1/00;* B29G *3/00*
U.S. Cl. 264—36 **3 Claims**



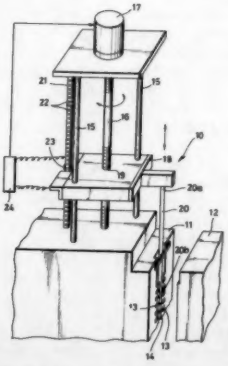
1. A method of repairing a conical crack in shatterproof glass comprising the steps of establishing an enclosed volume bounded in part by an area on the glass surrounding the crack and in part by a piston and cylinder assembly, an end of the cylinder being provided with a seal against the face of the glass, introducing a repair liquid into said volume and forcing said repair liquid under pressure into said crack by moving the piston of said piston and cylinder assembly toward said crack, characterized by the step of relieving the pressure on said repair liquid by forcing a pointed projection on an end of the piston against the apex of a separated cone of glass in the crack and breaking the seal between the end of the cylinder and the glass by applying to the cylinder a force which is a reaction to the force of the pointed projection against the cone of glass.

4,419,306

AUTOMATIC CONTROL OF THE LENGTH OF ARTICLE ROW TO BE INJECTION-MOLDED

Kiyomitsu Ishihara, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 27, 1982, Ser. No. 372,281
Claims priority, application Japan, Apr. 27, 1981, 56-62532
Int. Cl.³ B29F *1/05*
U.S. Cl. 264—40.5 **4 Claims**



1. A method of automatically controlling the length of a row of articles to be injection-molded on a multi-cavity mold hav-

ing an elongate runner and a plurality of successive cavities spaced equidistantly along the runner, comprising the steps of:

(a) electrically detecting an initial position of a control rod inserted in the runner;

(b) registering both the direction and the extent to which the control rod is to be moved for longitudinal adjustment with respect to the runner, depending on said initial position of the control rod and a preselected length of the article row to be molded;

(c) using a motor moving the control rod longitudinally of the runner in said registered direction;

(d) electrically detecting the movement of the control rod to said registered extent; and

(e) in response to the last-mentioned detecting, terminating the movement of the control rod.

2. An apparatus for automatically controlling the length of a row of articles to be injection-molded on a multi-cavity mold having an elongate runner and a plurality of successive cavities spaced equidistantly along the runner, comprising:

(a) a slide;

(b) means for moving said slide toward and away from the mold;

(c) a control rod projecting from said slide for extending into the runner and, in response to the movement of said slide, movable longitudinally of the runner for allowing heated molding material to be filled in only a selected number of the successive cavities that corresponds to a preselected length of a row of articles to be molded;

(d) means for detecting an initial position of said slide and thus said control rod in the runner and also for detecting the extent to which said slide and thus said control rod is moved; and

(e) a control unit, connected to both said moving means and said detecting means, for registering both the direction and the extent to which said control rod is to be moved for longitudinal adjustment with respect to the runner, depending on both said detected initial position of said control rod and said preselected length of the article row to molded, said control unit being adapted to produce a start signal for energizing said moving means to move said slide and thus said control rod in said registered direction, and a termination signal, when said slide and thus said control rod has been moved to said registered extent, for de-energizing said moving means to terminate the movement of said slide and thus said control rod.

4,419,307

METHOD FOR MANUFACTURING HEAT-INSULATING MEMBER AND DEVICE THEREFOR

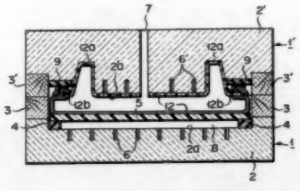
Koujirou Kohara, and Susumu Miyano, both of Takatsuki, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 29, 1982, Ser. No. 363,385

Claims priority, application Japan, Apr. 1, 1981, 56-48919

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—46.5 **9 Claims**



1. A method for manufacturing a heat-insulating member including a shell filled with a foamed heat-insulating material, which comprises the steps of:

providing first and second jigs, each including a jig body substantially formed of a heat-insulating material and having its inside contour substantially complementary to the outside shape of said shell, and a reinforcing frame arranged at the periphery of said jig body for reinforcing said jig body;

laying said shell which has not yet been filled with the heat-insulating material and is hollow, on the jig body of said first jig;

putting said second jig on said shell, thereby preventing said shell from being deformed when a foamable liquid composition is foamed within said shell in the step to follow;

injecting the foamable liquid composition into said shell to foam said composition therein; and,

removing a resultant heat-insulating member from said first and second jigs.

4,419,308

PROCESS FOR PRODUCING POROUS, FILM-LIKE OR FIBROUS STRUCTURE OF AROMATIC POLYESTER

Shunichi Matsumura, and Hiroo Inata, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 28, 1983, Ser. No. 479,724

Claims priority, application Japan, Apr. 13, 1980, 55-60294

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—49 **23 Claims**

1. A process for producing a porous, film-like or fibrous structure of an aromatic polyester, which comprises

(1) forming a substantially non-oriented film-like or fibrous structure by melt-molding an aromatic polyester blend composed of

(A) an aromatic polyester containing an aromatic dicarboxylic acid as a main acid component and an aliphatic diol and/or an alicyclic diol as a main glycol component, and

(B) at least one low-molecular-weight compound selected from the group consisting of imide compounds and isocyanurate compounds being compatible, but substantially non-reactive, with the aromatic polyester and having a molecular weight of not more than 1,000,

the low-molecular-weight compound being present in an amount of 10 to 300 parts by weight per 100 parts by weight of the aromatic polyester, and

(2) extracting at least a major part of the low-molecular-weight compound from the resulting substantially non-oriented film-like or fibrous structure with an organic solvent which can dissolve the low-molecular-weight compound but under the extracting conditions does not substantially dissolve the aromatic polyester.

4,419,309

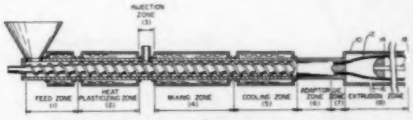
POLYSTYRENE FOAM EXTRUSION INTO A FOAM ASSISTING ATMOSPHERE

Charles M. Krutchen, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,455

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—53 **19 Claims**



1. A process for preparing a thermoplastic resin thermoformable foam in sheet form comprising:

(a) melting a thermoplastic resin;

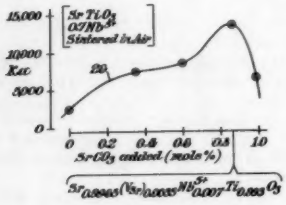
(b) introducing thereto, under pressure, a foaming agent in liquid form, said agent being a member selected from the group consisting of a low molecular weight aliphatic hydrocarbon, a low molecular weight halocarbon and mixtures thereof; and

(c) extruding the combination in sheet form directly into a lower pressure atmosphere of a member selected from the group consisting of carbon dioxide, water vapor and mixtures thereof to cause foaming of said resin so as to expose both surfaces of said sheet to said lower pressure atmosphere.

4,419,310
SRTIO$_3$ BARRIER LAYER CAPACITOR

Ian Burn, and Stephen M. Neirman, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 6, 1981, Ser. No. 261,065
Int. Cl.^{3} C04B *33/32*
U.S. Cl. 264—59 **11 Claims**



1. A method for making an intergranular barrier layer type capacitor without heating in a reduced atmosphere comprising:

(a) preparing a ceramic start mixture consisting essentially of strontium, titanium and strontium-titanate donor compounds, said donors being selected from large cations A, small cations B and combinations thereof, said start mixture being adjusted to form during sintering a ceramic compound selected from

$$Sr_{1-\frac{3}{2}x}A_xTiO_3$$

$$Sr_{1-\frac{1}{2}y}B_yTi_{1-y}O_3$$

$$Sr_{1-w}B_wTi_{1-w}O_3$$

and combinations thereof, to wit

$$Sr_{1-\frac{3}{2}x-\frac{1}{2}y-w}A_xB_yB_wTi_{1-y-w}O_3$$

wherein x, y and w are the atomic proportions, respectively, of said donor cations having a charge of +3, +5 and +6, so that both charge balance and large/small cation balance may be established by strontium vacancies, $(V_{Sr})\frac{1}{2}x+\frac{1}{2}y+w$ therein, and wherein $x+y+w$ is from 0.003 to 0.017;

(b) forming a body of said mixture;

(c) sintering said body in air to maturity to form in said body semiconductive grains and interstitial dielectric barrier layers;

(d) diffusing oxidizing agents containing bismuth into said body to increase the insulation resistance of said interstitial barrier layers; and

(e) forming two spaced electrodes in contact with said body.

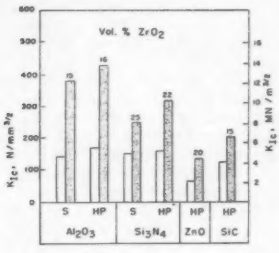
4,419,311
PRODUCTION OF HIGH-STRENGTH CERAMIC BODIES OF ALUMINA AND UNSTABILIZED ZIRCONIA WITH CONTROLLED MICROFISSURES

Nils Claussen, Brandenburger Str. 13, Warnbronn, Fed. Rep. of Germany (7251), and Jörg Steeb, Reessweg 21, Stuttgart, Fed. Rep. of Germany (7000)

Division of Ser. No. 167,898, Jul. 14, 1980, Pat. No. 4,298,385, which is a continuation of Ser. No. 4,120, Jan. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 738,409, Nov. 3, 1976, abandoned. This application Jul. 6, 1981, Ser. No. 280,408

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549652

Int. Cl.^{3} C04B *35/00, 35/10, 35/48, 35/71*
U.S. Cl. 264—60 **3 Claims**



1. A method of preparing a ceramic body of high toughness by mixing an aluminum oxide matrix forming ceramic material and a ceramic embedment material, shaping and firing, comprising

mixing 4% to 25% of the volume of the body, of unstabilized zirconium dioxide and/or hafnium dioxide in the form of 0.3 to 1.25 μm particles as the embedment material, with the aluminum oxide matrix forming ceramic material in the form of particles of less than 5 μm, in a ball mill, including an inert mixing and grinding container and inert balls and with the use of an inert mixing liquid, or in an attrition mill, and

thereafter sintering by pressing the mixture to form a body and sintering or sintering by hot pressing the mixture in a mold, at a temperature of 1400° to 1500° C.,

whereby tensile stresses for the formation of controlled microfissures are generated in the ceramic body.

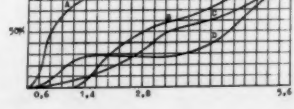
4,419,312
METHOD FOR MAKING GRANULAR HYDROTHERMALLY HARDENED MATERIAL

Hendrik Loggers, Amerongen, and Gijsbert Versteeg, Nunspeet, both of Netherlands, assignors to Aarding Weerstandslas B.V., Nunspeet, Netherlands

Filed Jan. 2, 1979, Ser. No. 564

Claims priority, application Netherlands, Dec. 30, 1977, 7714619

Int. Cl.^{3} B28B *1/00*; B29C *25/00*
U.S. Cl. 264—82 **11 Claims**



1. A method for producing hydrothermally hardened products by granulating a water hardenable mixture of calcareous

and silicious materials and water and heating said granulated material under steam pressure in an autoclave, the improvement comprising the following steps:

(1) In a first stage, heating to a steam pressure in the autoclave of at most 0.9 atmospheres, being 1.9 atmospheres absolute pressure;

(2) subsequently decreasing the steam pressure in the autoclave so that the product in the first stage is subjected in a second stage at a steam pressure in the autoclave being less than 1.9 atmospheres absolute pressure, but more than 1.1 atmospheres absolute pressure; and (3) subsequently increasing the steam pressure in the autoclave so that the products from the second stage are subjected in a third stage at a steam pressure in the autoclave of at least 2 atmospheres absolute pressure wherein the first, second and third stages follow subsequently and after each other without absence of any steam pressure.

4,419,313

SELF CRIMPING YARN AND PROCESS

James E. Bromley; John R. Dees; Harold M. Familant; Wayne T. Mowe, all of Pensacola, Fla., and Darwyn E. Walker, Wilbraham, Mass., assignors to Fiber Industries, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 55,859, Jul. 9, 1970, abandoned, which is a continuation of Ser. No. 825,495, Aug. 17, 1977, abandoned. This application Jul. 9, 1980, Ser. No. 167,164

Int. Cl.³ D01D *3/00, 5/22*

U.S. Cl. 264—167 **11 Claims**

1. A process for producing a self-crimping yarn, said yarn comprising a plurality of variable denier filaments, each of said filaments produced by the steps comprising:

a. generating two individual streams of molten polyester of fiber-forming molecular weight, said individual streams travelling at different velocities;

b. converging said individual streams side-by-side to form a combined stream;

c. quenching said combined stream to form a combined filament; and

d. withdrawing said combined filament from said combined stream at a rate of speed in excess of 3000 meters per minute and selected such that an individual filament quenched from one of said individual streams would have a shrinkage at least ten percentage points higher than that of an individual filament quenched from the other of said individual streams.

4,419,314

METHOD OF COATING CORE SAMPLES

Darrell Bush, Colleyville, Tex., assignor to Core Laboratories, Inc., Dallas, Tex.

Filed May 26, 1981, Ser. No. 266,990

Int. Cl.³ B29C *1/02*

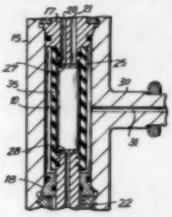
U.S. Cl. 264—130 **7 Claims**

1. A method of preparing a geological core sample containing pore spaces and representative of an underground formation from which the sample is taken to prepare the core sample for testing in testing apparatus in which pressures are applied to the core sample to simulate approximate overburden pressure to which the sample material was subjected in its underground formation, the method comprising:

applying a petroleum based release material to the exterior surface of the core sample;

partially filling a mold with a plastic mixture of hardenable epoxy resin and hardener therefor;

inserting one end of said core sample into the partially filled mold, the space between said sample and the interior of said mold lying within the range of from about 0.010 cm. to about 0.050 cm, to form a plastic coating on said sample substantially free of voids and having a thickness within said range so that the plastic coating on the thus coated



sample is sufficiently thick and stiff to prevent intrusion into the pores of the core sample during testing of the core sample under confining pressure yet is sufficiently thin to transmit the confining pressure to the sample;

applying a sufficient pressure to the opposite end of the core sample to slowly urge said sample into said mold until the plastic mixture therein covers the entire surface of said sample;

curing the plastic material for a period of time sufficient to form a stiff coating on the core sample;

removing the thus-coated core sample from said mold; and

cutting off the ends of the core sample to remove the coating from said ends.

4,419,315

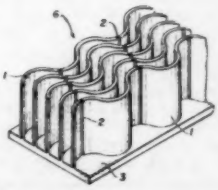
EXTRUDED FIN-TYPE WEATHERSTRIP

Gerald Kessler, 302 McClurg Rd. at Southern Blvd., Box 389, Youngstown, OhioIO 44501

Division of Ser. No. 333,912, Dec. 23, 1981. This application Aug. 20, 1982, Ser. No. 409,900

Int. Cl.³ D04H *11/00*

U.S. Cl. 264—145 **13 Claims**



1. A method of extrusion forming of a resilient, all plastic, thin, wavy fin-type weatherstrip having an elongated longitudinal substrate from which integrally projects vertically therefrom a plurality of thin, flexible, deformable, wavy S-configured fin members extending in the direction of extrusion, said fin members being spaced generally parallel to one another, said process comprising:

providing an unbalanced extrusion die having a substrate forming orifice of a first thickness and a plurality of fin forming orifices of a second thickness extending from one side of the substrate forming orifice, wherein the first

thickness is substantially greater than the second thickness, and

extruding plastic through said unbalanced extrusion die so that the rate of the plastic flow through the fin forming die orifices is substantially greater than the rate of flow of the plastic through the substrate forming die orifice.

2. A method of extrusion forming of a resilient, all plastic, thin, wavy fin-type weatherstrip having an elongated longitudinal substrate from which integrally projects vertically therefrom a plurality of thin, flexible, deformable, wavy S-configured fin members extending in the direction of extrusion, said fin members being spaced generally parallel to one another, said process comprising:

providing an extrusion die formed in sections including a fin orifice section having a plurality of fin forming orifices of a second thickness, and a substrate orifice section connected thereto having a substrate forming orifice of a first thickness, wherein said first thickness is substantially greater than said second thickness, and

extruding plastic through said extrusion die while oscillating one said orifice section relative to the other said orifice section.

4,419,316

PROCESS OF MAKING FILMS, FIBERS OR OTHER SHAPED ARTICLES CONSISTING OF, OR CONTAINING, POLYHYDROXY POLYMERS

Richard G. Schweiger, San Jose, Calif.

Continuation of Ser. No. 945,252, Sep. 25, 1978, abandoned, which is a continuation of Ser. No. 794,145, May 5, 1977, abandoned, which is a division of Ser. No. 669,483, Mar. 23, 1976, Pat. No. 4,035,569, which is a continuation of Ser. No. 487,196, Jul. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 298,580, Oct. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 40,442, May 25, 1970, Pat. No. 3,702,943. This application Oct. 29, 1980, Ser. No. 201,806

Int. Cl.³ D01F *11/02, 11/04;* **C08L** *1/16, 5/00*

U.S. Cl. 264—184 **54 Claims**

1. A process of preparing films, fibers or other shaped articles comprising cellulose, which process comprises forming a cellulose nitrite ester by reacting dinitrogen tetroxide or nitrosyl chloride with activated cellulose that contains about 4 to 12 percent by weight of water which is homogeneously distributed within the cellulose, said reaction being conducted in a reaction medium containing a solubilizing agent for the cellulose nitrite ester and a proton acceptor which is a highly polar aprotic solvent or a weak tertiary amine base at a temperature of below about 50° C., bringing the reaction mixture containing the nitrite ester into the desired shape while maintaining the temperature below about 50° C., and regenerating and separating said cellulose polymer from said reaction mixture by contact with a protic solvent in the presence of an acid catalyst to form films, fibers or other shaped articles of essentially unmodified cellulose.

2. A process of preparing films, fibers or other shaped articles comprising cellulose, which process comprises forming a cellulose nitrite ester by reacting dinitrogen tetroxide or nitrosyl chloride with activated cellulose in which cellulose containing in excess of about 4 percent by weight of water uniformly distributed within the cellulose is treated with a highly polar aprotic solvent or a weak tertiary amine base to reduce the water content of the cellulose to below about 4 percent, said reaction being conducted at a temperature below about 50° C. in a reaction medium containing a solubilizing agent for the resulting cellulose nitrite ester and a proton acceptor which is a highly polar aprotic solvent or a weak tertiary amine base, bringing the reaction mixture containing the nitrite ester into the desired shape while maintaining the temperature below about 50° C., and regenerating and separating said cellulose polymer from said reaction mixture by contact with a protic solvent in the presence of an acid catalyst to form films, fibers or other shaped articles of essentially unmodified cellulose.

43. A solution of the nitrite ester of starch or a starch fraction and an organic-solvent-soluble polymer substantially lacking hydroxyl groups in an anhydrous medium containing a highly polar aprotic solvent or a weak tertiary amine base or both.

47. A solution of the nitrite ester of polyvinyl alcohol and an organic-solvent-soluble polymer substantially lacking hydroxyl groups in an anhydrous medium containing a highly polar aprotic solvent or a weak tertiary amine base or both.

4,419,317

PROCESS FOR THE PREPARATION OF FIBERS OF POLY-P-PHENYLENE-TEREPHTHALAMIDE

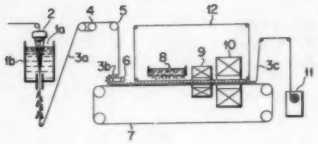
Takashi Fujiwara, Miyazaki; Shuji Kajita, Takatsuki; Tetsuo Matsushita, Miyazaki, and Seiichi Manabe, Ibaraki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 129,403, Mar. 11, 1980, Pat. No. 4,374,977. This application May 21, 1982, Ser. No. 380,781

Claims priority, application Japan, Mar. 13, 1979, 54-29116

Int. Cl.³ D01D *5/12*

U.S. Cl. 264—184 **9 Claims**



1. A process for the preparation of fibers consisting essentially of poly-p-phenylene-terephthalamide, which comprises extruding an anisotropic dope of a polymer consisting essentially of poly-p-phenylene-terephthalamide in concentrated sulfuric acid having a concentration of at least 98% by weight, in a non-coagulating layer, passing the extrudate through a coagulating layer, depositing the resulting coagulated fibers on a net conveyor, and in the absence of substantial tension sequentially washing the fibers to remove sulfuric acid, holding the fibers in saturated steam maintained at at least 100° C., and drying the fibers at a temperature in the range of from 120° C. to 450° C. for a time satisfying the condition:

$$250 \leqq (\text{temperature, °C.}) \times (\text{time, seconds})^{0.08} \leqq 600.$$

4,419,318

PROCESS FOR FORMING PROJECTILES FOR SMOOTH BORE SHOOTING GUNS

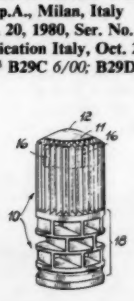
Vincenzo Turco, and Antonio Pompili, both of Colleferro, Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Oct. 20, 1980, Ser. No. 199,039

Claims priority, application Italy, Oct. 26, 1979, 26831 A/79

Int. Cl.³ B29C *6/00;* **B29D** *3/00*

U.S. Cl. 264—274 **4 Claims**



1. A process for forming a projectile for use in a smooth bore gun and of the type including a combined metal bullet and a wad-flight control element formed of a plastic material, said process comprising:

forming a metal bullet having a front end of ogival configuration, a rear end, and at least one cylindrical intermediate section having extending therefrom fins;

positioning said bullet in a die and centering said bullet therein by contacting the ogive of said front end and said fins with respective first and second inner surfaces of said die, while maintaining a generally annular space around said cylindrical section, between said cylindrical section and said second inner surface of said die;

positioning adjacent said rear end of said bullet within said die a plurality of die inserts of a configuration to define therebetween a reticulated space in communication with said annular space and a cup-shaped space in communication with said reticulated space and facing away therefrom; and

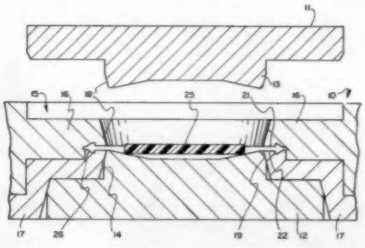
injecting plastic material into and filling said cup-shaped space, said reticulated space and said annular space, thereby fixedly forming on said metal bullet a plastic wad-flight control element including a container portion fixed to and surrounding said bullet and formed from plastic injected into said annular space, a reticulated portion integral with and extending rearwardly from said container portion and formed from plastic injected into said reticulated space, and a sealing cup portion integral with and extending rearwardly from said reticulated portion and formed from plastic injected into said cup-shaped space.

4,419,319

PREFORM STRUCTURE

Virgil C. Reynolds, Jr., Yorktown, Ind., and Daryl D. Cerny, Greenville, Ohio, assignors to Ball Corporation, Muncie, Ind.

Filed Aug. 10, 1981, Ser. No. 291,540
Int. Cl.³ B29C *17/03, 3/00*
U.S. Cl. 264—292 **6 Claims**



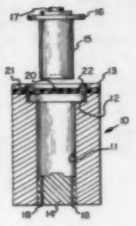
1. A process of obtaining a predetermined volume of thermoplastic material having a multilayered structure for a container with a rim portion formed from a preform comprising the steps of providing a thermoplastic blank of material comprising layers of different polymers for said container, bringing said blank to a temperature in a range from just below the softening temperature to about the melting temperature of the material, forging said material in a forging mold provided with a container forming portion, including said rim portion and a retaining portion defined by a circumferential cavity communicating with said container forming portion and allowing said material to flow outwardly from said container forming portion into said circumferential cavity, the layers of said multilayered structure being forced beyond the rim forming portion into the retaining portion to collect residual thermoplastic material therein whereby a predetermined and specific volume is defined in said container forming portion, including said rim portion, all the layers being advanced beyond the rim forming portion of the preform into the circumferential cavity, and removing the forged preform from said forging mold.

4,419,320

NOVEL PROCESS FOR DEEP STRETCH FORMING OF POLYESTERS

William G. Perkins, Cuyahoga Falls, and Clem B. Shriver, Clinton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 199,139, Oct. 22, 1980, Pat. No. 4,358,492. This application Aug. 20, 1982, Ser. No. 409,770
Int. Cl.³ B29C *17/03*
U.S. Cl. 264—296 **9 Claims**



1. A deep stretch forming process for preparing biaxially oriented, heat set, hermetically sealable, hollow containers with cylindrical sidewall and bottom sections measuring approximately the same thickness, from high molecular weight polyester, said process comprising the steps of

(A) injection molding a contoured preform of high molecular weight polyester, said contoured preform consisting of a thick peripheral clamping section and immediately interiorly thereof a tapered central section which radially increases in thickness from about one-fourth the thickness of the peripheral clamping section at a point immediately adjacent to said clamping section to about the same thickness as that of the peripheral clamping section at about the center axis of said contoured preform;

(B) heatng the contoured preform at a temperature ranging from about 10° C. below to about 30° C. above the glass transition temperature of the polyester comprising said contoured preform and clamping said preform exteriorly to and above a hollow die comprising a chamber or cavity having an annular flange forming recess in the upper portion thereof;

(C) forcing the tapered central section of the contoured preform through the entrance aperture of and into the chamber or cavity of said hollow die by means of a forming plunger having a flange forming annular ring affixed to the upper portion thereof, said plunger being heated to a temperature ranging from about 10° C. below to about 30° C. above the glass transition temperature of the polyester comprising the contoured preform;

(D) increasing the temperature of the forming plunger to a temperature sufficient to induce rapid crystallization of the polyester in the hollow container formed from the contoured preform to anneal or heat set the polyester in the formed container; and

(E) cooling the formed container in the hollow die to a temperature below the glass transition temperature of the polyester in the hollow container prior to finally removing the container from the hollow die.

4,419,321

METHOD OF FORMING AN INTEGRATED TRUSS STRUCTURE

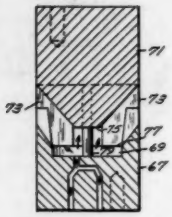
James S. Hardigg, Conway, Mass. 01341

Continuation of Ser. No. 105,864, Dec. 20, 1979, abandoned. This application Jan. 22, 1982, Ser. No. 341,866
Int. Cl.³ B29F *1/08*
U.S. Cl. 264—328.12 **3 Claims**

1. The method of forming an integrated truss structure with

a mold having a first fixed mold member including a plurality of spaced raised flat portions, a plurality of spaced recessed flat portions, and a plurality of open grooves connecting said raised and recessed portions, said open grooves sloping from said raised flat portions to said recessed flat portions, and a second movable mold member, including a plurality of spaced raised flat portions, a plurality of spaced recessed flat portions, and a plurality of open grooves connecting said raised flat portions and said recessed flat portions, said open grooves sloping away from said raised flat portions to said recessed flat portions, the method comprising the steps of:

moving said second mold member into registration with said first mold member, wherein said raised flat portions of said first member are aligned with said recessed flat portions of said second member and vice versa, the position of said raised and recessed flat portions of said first and second mold members defining a plurality of junction chambers and the position of said open grooves of said first and second mold members defining a plurality of strut beam chambers;



injecting a moldable material into and throughout said strut beam chambers and said junction chambers formed by said registration of said first and second mold members to form a unitary molded truss structure;

cooling said moldable material until said material is solidified; and

separating said second mold member from said first mold member to permit removal of said molded integrated truss structure.

4,419,322

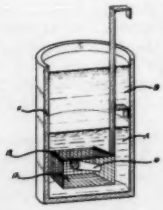
METHOD FOR DILATING PLASTICS USING VOLATILE SWELLING AGENTS

Dudley A. Clemence, and Pankaj K. Das, both of Willimantic, Conn., assignors to Akzona Incorporated, Asheville, N.C.

Filed Sep. 27, 1982, Ser. No. 424,116

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—343 **7 Claims**



1. A method for dilating a cold shrink plastic article which comprises the steps of:

immersing said article into the lower phase of a bath having distinct upper and lower phases with said upper and lower phases being substantially immiscible, said lower phase being a volatile swelling agent for said cold shrink plastic article and having a specific gravity greater than that of said upper phase; said upper phase acting as a blanket to substantially prevent vaporization of said lower phase;

allowing said article to remain in said lower phase of said bath until it has dilated; and,

removing said article from said bath for use.

4,419,323

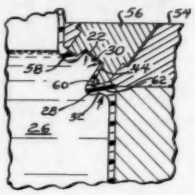
METHOD FOR MANUFACTURING A PLASTIC CONTAINER WITH NON-CORING PENETRABLE WALL PORTION

David A. Winchell, Twin Lakes, Wis., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 119,716, Feb. 8, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 311,094

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—523 **6 Claims**



1. A method for manufacturing a plastic container having a penetrable wall portion, which is thin relative to the thickness of the container walls, from a tubular plastic parison about a fill tube, the steps comprising:

(a) providing a mold cavity having a bottom wall surface, a side wall extending upwardly from the bottom wall surface, a projecting step above the bottom wall surface and projecting from the side wall and a recess adjacent to and above at least a portion of the projecting step;

(b) inserting the fill tube with the plastic parison thereabout into the mold cavity;

(c) expanding the parison to conform to the inside surface of the mold cavity by the application of pressure from the fill tube, below the projecting step in the mold cavity;

(d) blocking the flow of plastic from the expanding parison at the projecting step as the parison expands from the bottom wall surface along the side wall of the mold cavity; and

(e) thereby arranging the portion of the plastic parison spanning the recess so that the portion diminshes in thickness as it moves into the recess toward the end thereof, the mold cavity recess end corresponding to the thin penetrable wall portion of the container.

4,419,324

METHOD FOR CONTINUOUS FRICTION ACTUATED EXTRUSION

John B. Childs, and Owen P. McKenna, both of London, England, assignors to BICC Public Limited Company, London, England

Filed Oct. 30, 1981, Ser. No. 316,681

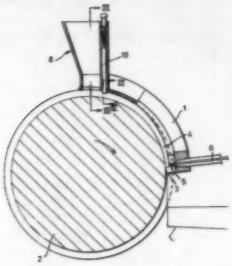
Claims priority, application United Kingdom, Nov. 17, 1980, 8036834

Int. Cl.³ B22F *1/00*

U.S. Cl. 419—67 **3 Claims**

1. A method of continuous friction-actuated extrusion comprising the steps of feeding extrudible metal in particulate form into a first end of a passageway formed between first and second members with said second member having greater surface area for engaging said extrudible metal than the first member, said passageway having an obstruction at a second end remote from said first end and having at least one die orifice associated with the obstructed end, and continuously

moving the passageway defining surface of said second member relative to the passageway defining surface of the first member in the direction towards the die orifice from said first end to said second end such that frictional drag of the passageway defining surface of the second member draws said extrudible metal through the passageway and generates in said extrudible metal a pressure that is effective to extrude said extrudible metal through the die orifice to form a body of uniform cross-



section and indefinite length, wherein said extrudible material is fed into said passageway at a low rate such that the rate at which said body emerges from said die orifice is consequent upon and substantially equal to the rate of feeding, said passageway being of uniform cross-sectional area and said extrudible metal being fed thereto by a storage hopper feeding to said passageway through an adjustable constriction having a cross-sectional area smaller than the cross-sectional area of said passageway.

4,419,325

DENTAL ALLOYS FOR PORCELAIN-FUSED-TO-METAL RESTORATIONS

Arun Prasad, Cheshire, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Filed Jul. 21, 1982, Ser. No. 400,481
Int. Cl.³ C22C *5/04, 30/02*
U.S. Cl. 420—464 **12 Claims**

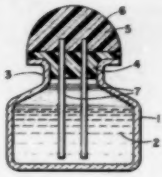
1. A grain-refined palladium based dental alloy for porcelain-fused-to-metal restorations consisting by weight of essentially about 35–85% palladium, 0–12% copper, 5–15% gallium, 0–50% gold, 0–5% aluminum, 0–13% cobalt and 0.1–0.5% ruthenium or rhenium, the total of the constituents being 100%.

4,419,326

VAPOR DISPERSING PROCESS

Thomas F. Santini, New York, N.Y., assignor to De Laire, Inc., New York, N.Y.

Division of Ser. No. 259,068, Apr. 30, 1981, which is a continuation-in-part of Ser. No. 246,089, Mar. 23, 1981, abandoned. This application Sep. 21, 1982, Ser. No. 420,848
Int. Cl.³ A61L *9/04, 9/12*
U.S. Cl. 422—4 **5 Claims**



1. A process for vaporizing a volatile air treating liquid having a volatile component and a non-volatile component, comprising supplying said air treating liquid to a porous element having an open cell surface, predetermining the rate at which said non-volatile component will occlude said open cell surface, and impregnating said open cell surface, prior to contact by said air treating liquid, with a volatile occluding agent whose rate of vaporization from said open cell surface bears a desired relationship to said predetermined occluding rate of said non-volatile component, whereby the evaporation rate of said volatile component occurs at a desired rate over an extended period of time.

4,419,327

METHOD OF SCAVENGING DISSOLVED OXYGEN IN STEAM GENERATING EQUIPMENT USING AMMONIA OR AMINE NEUTRALIZED ERYTHORBIC ACID

John A. Kelly, Woodridge, and Cynthia A. Soderquist, Bolingbrook, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 22, 1981, Ser. No. 333,379
Int. Cl.³ C23F *11/10*
U.S. Cl. 422—17 **8 Claims**

1. A method of removing dissolved oxygen from boiler feedwater and passivating boiler metal surfaces comprising adding to said boiler feedwater an oxygen scavenging amount of an ammonium or amine neutralized erythorbate at a pH of at least about 5.0.

4,419,328

CONTROLLED FLUIDIZED BED REACTOR FOR TESTING CATALYSTS

Dennis E. Walsh, Richboro, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,546
Int. Cl.³ G01N *31/12;* B01J *8/18*
U.S. Cl. 422—62 **9 Claims**

1. Apparatus for investigating the performance of a catalyst used in a continuous catalytic cracking process for the conversion of a stream of hydrocarbon feed stock wherein said stream is contacted with an active catalyst in a reactor maintained under catalytic cracking conditions to provide reaction products which are removed from said reactor, the catalyst in said reacator becoming contaminated by the deposition of coke thereon, said apparatus comprising:

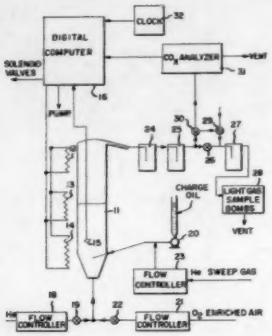
a single fluidized bed laboratory scale reactor charged with the catalyst to be investigated;

means for supplying hydrocarbon feed stock to said reactor;

means for supplying air to said reactor for regeneration of said catalyst;

means for controlling said means for supplying in successive and repeated cyclic catalyst cracking intervals and cyclic catalyst regeneration intervals;

means for monitoring the reaction product yields from said reactor and the coke deposited on said catalyst whereby the performance of said catalyst in a larger continuously operated catalytic cracking process is assessed in said laboratory scale reactor operated cyclically; and



means for monitoring the concentration of CO and CO_2 in said reactors during said regeneration intervals by control of a computer;

means for periodically recording the monitored values of CO and CO_2; and

means for increasing the frequency of said monitoring and recording as the concentration of CO and CO_2 increases in said reactor.

4,419,329

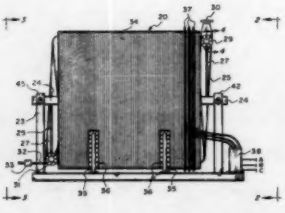
DEVICE FOR PRODUCING HYDROGEN AND OXYGEN GASES

Charles H. Heller, 17 Beth Dr., Moorestown, N.J. 08057

Continuation of Ser. No. 167,339, Jul. 9, 1980, abandoned. This application Apr. 15, 1982, Ser. No. 368,571

Int. Cl.³ B01J *7/00, 19/08, 19/12*

U.S. Cl. 422—111 **13 Claims**



1. An apparatus to disassociate combustion product compound into its component fuel part and oxygen gases comprising:

(a) a source of combustion product compound,

(b) a tube to carry the compound,

(c) acceleration means to cause the compound to accumulate a high level of velocity kinetic energy, comprising an ionization means to continuously add excess electrons to the compound,

(d) a porous plug of catalytic metal in the tube in the path of the compound allowing the high velocity compound to pass through the porous plug, and wherein the ionization means comprises the tube constructed of a layer of semi-conductor N-function material on the outside, a P-function material layer next inside, and a non-magnetic layer on the inside in contact with the compound flow.

4,419,330

THERMAL REACTOR OF FLUIDIZING BED TYPE

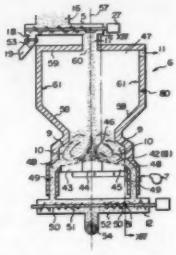
Hideo Ishihara, Yokohama; Takahiro Ohshita, Kanagawa, and Harumitsu Saito, Yokohama, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,875

Claims priority, application Japan, Jan. 27, 1981, 56-10520; Jan. 29, 1981, 56-10841

Int. Cl.³ F27B *15/16;* **B01J** *8/30*

U.S. Cl. 422—143 **15 Claims**



1. A thermal reactor of the fluidized bed type, comprising:

a vertical furnace housing having a generally rectangular horizontal cross-section;

a diffusion means disposed in the lower portion of the inside of said housing and extending from one side wall to the opposite side wall of said housing, said diffusion means having a plurality of gas discharging means spaced across the width of the inside of said housing for discharging fluidizing gas upwardly into said housing, a pressurized fluiding gas source, and gas distributing means coupled between said gas source and said gas discharging means for supplying a greater mass flow of fluidizing gas to the gas discharging means adjacent the opposite side walls than that at the center portion of the width of the inside of said housing for producing a central fluidized bed of fluidized medium above said center portion and side fluidized beds of fluidized medium on opposite sides of said center fluidized bed adjacent said walls, said side fluidized beds whirling adjacent said side walls and moving upwardly and said central fluidized bed generally tending to descend between said two upwardly moving side fluidized beds, the top of said diffusion means being a single inverted V-shape cross-section member having the opposite lower ends adjacent said side walls;

a material charging means operatively associated with said housing for charging material to be processed into said housing onto the top portion of said central fluidized bed;

two deflecting means, one on each of the opposite side walls of said housing and extending inwardly toward each other with a gap between the inner ends thereof above the top of said central fluidized bed, the lower surfaces of said deflecting means being upwardly and inwardly inclined into said housing for deflecting the upward flow of said side fluidized beds toward the portion of said housing above said central fluidized bed, the space from the top of said diffusion means up to said two deflecting means and between the opposite side walls being clear of any obstructions to flow in the direction between said opposite side walls whereby said central fluidized bed and said side fluidized beds can contact each other freely; and

discharge means in the bottom part of said furnace housing for discharging incombustible residue from said furnace housing.

4,419,331

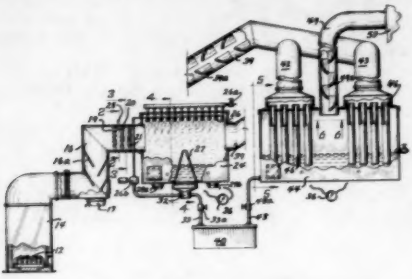
SULPHUR DIOXIDE CONVERTER AND POLLUTION ARRESTER SYSTEM

Victor H. Montalvo, Owensboro, Ky., assignor to Michael F. Walters, Owensboro, Ky., a part interest

Filed Apr. 12, 1982, Ser. No. 367,419

Int. Cl.³ B01D *50/00*

U.S. Cl. 422—170 9 Claims



1. A sulphur dioxide converter and pollution arresting system comprising a source of smoke containing sulphur dioxide, ductwork directing the movement of said smoke into a first treating chamber, said ductwork including a turbulence creating zone, means introducing a catalyst into said ductwork, said first treating chamber having a series of outlets therein passing atomized liquid directly downwardly by gravity through the path of movement of said smoke, a deflector disposed within said first treating zone serving solid and liquid separating purposes, a second treating chamber communicating with said first treating chamber, said second treating chamber positioning a series of depending conduits for passage of said smoke and including a volume of liquid at the bottom thereof into which said series of conduits extend and into which said smoke is introduced, an outlet duct directly communicating with said second treating chamber at the top thereof and above the level of said liquid and arranged to permit liquid entrained in smoke passing from said second treating chamber to return by gravity flow into said second treating chamber, and a flue communicating with said outlet duct achieving the vacuum flow of said smoke through said system, said sulphur dioxide in said smoke combining with said catalyst and said liquid in said first and said second treating chamber to produce sulphuric acid.

4,419,332

EPITAXIAL REACTOR

Hubert von der Ropp, Nordheim, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

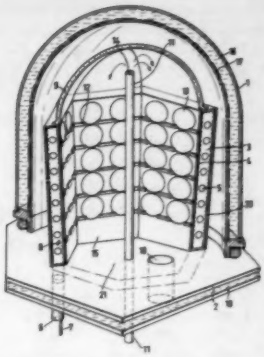
Filed Oct. 21, 1980, Ser. No. 200,548

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1979, 2943634

Int. Cl.³ C30B *25/10*

U.S. Cl. 422—245 10 Claims

1. In an epitaxial reactor with a modified heat pipe system for the epitaxial deposition of semiconductor layers on semiconductor substrate discs, comprising an enclosed and evacuable container, a heating tube disposed in the container and enclosing a reaction chamber, a seal covering one end of the heating tube to enclose the reaction chamber, a transport line passing into the container and the reaction chamber and having an outlet end in the vicinity of the seal for introducing reaction gas into the reaction chamber, means defining an outlet extending from the reaction chamber and through the container for the exhaust of reaction gas from the reaction chamber, with the surface of the heating tube which faces the reaction chamber being provided for accommodating the discs, the improvement wherein said heating tube comprises two concentric walls spaced apart to delimit a sealed inner chamber, and said reactor further comprises a heat source and a temperature control system located in said inner chamber and operative for automatically providing a selected, uniform temperature in said reaction chamber based on the saturation temperature of the vapor pressure existing in said inner chamber.



4,419,333

PROCESS FOR REMOVAL OF NITROGEN OXIDES

Josef Reus, Maintal; Hans Wewer, Schoneck, and Hofmann Jürgen, Bad Orb., all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 237,950, Feb. 25, 1981, abandoned. This application Jul. 16, 1982, Ser. No. 398,929

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3008012

Int. Cl.³ C01B *21/00*

U.S. Cl. 423—235 7 Claims

1. A process for the removal of nitrogen monoxide from a gas mixture by scrubbing the nitrogen monoxide containing gas mixture with a nitric acid solution in the column portion of an absorption apparatus consisting essentially of a column and a sump, said process comprising passing the nitric acid solution from the column portion to the sump and introducing gaseous oxygen as an oxidizing agent into the nitric acid present as a 15–50 weight % solution in said sump, there being a sufficiently large volume of said nitric acid solution containing said oxygen present in the sump that there is produced the oxidation of the nitrogen monoxide in the solution and wherein the thus purified gas mixture still contains residual nitrogen monoxide and nitrogen dioxide and oxidizing the residual nitrogen monoxide and nitrogen dioxide with hydrogen perioxide to convert the residual nitrogen monoxide and nitrogen dioxide to nitric acid.

4,419,334

PROCESS FOR COOLING AND SEPARATING CHLORIDES AND FLUORIDES FROM GAS MIXTURES

Robert Karger, Dortmund, Fed. Rep. of Germany, assignor to Vereinigte Elektrizitätswerke Westfalen Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,920

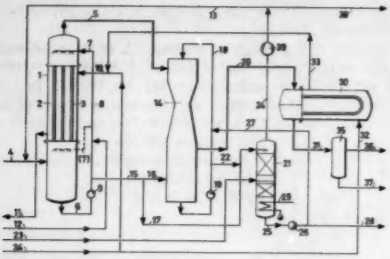
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1980, 3043329

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—240 18 Claims

1. A method for cooling and selective separation of chlorides and fluorides from hot mixtures of gases generated by gasifying solid or liquid fuels or by extracting gas from solid fuels comprising cooling the gas mixture in the presence of a circulating liquid of ammonia and water in a cooler to a temperature at or below the adiabatic saturation temperature to condense the

steam contained in said gas and forming, by sublimation of gaseous NH_3, HCl or HF, solid ammonium chloride and ammonium fluoride, and wherein a part of said solids is dissolved in the condensed steam or, respectively, in the circulation liquid, and discharging the dissolved material from the cooler.



4,419,335
PROCESS FOR PRODUCING RHOMBOHEDRAL SYSTEM BORON NITRIDE

Toshihiko Ishii, and Tadao Sato, both of Sakura, Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

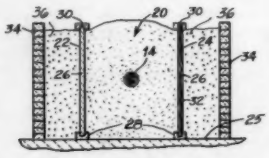
Filed Mar. 10, 1982, Ser. No. 356,784
Claims priority, application Japan, Oct. 26, 1981, 56-171249
Int. Cl.³ C01B *21/06*
U.S. Cl. 423—290 **10 Claims**

1. A process for producing high-purity rhombohedral system boron nitride, having good crystallinity, which comprises heating a boron material selected from the group consisting of boron oxide, boric acid and an oxygen-containing boron compound capable of forming boron oxide when heated, at a temperature of from 1200° to 2100° C., thereby vaporizing the boron oxide and reacting the vaporized boron oxide with hydrogen cyanide or cyanogen gas.

4,419,336
SILICON CARBIDE PRODUCTION AND FURNACE

Areekattuthazhayil K. Kuriakose, Gloucester, Canada, assignor to Norton Company, Worcester, Mass.

Filed Mar. 29, 1982, Ser. No. 362,701
Int. Cl.³ C01B *31/36*
U.S. Cl. 423—345 **1 Claim**

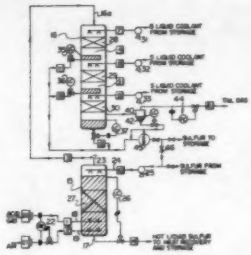


1. A method of making a larger percentage of coarsely crystalline silicon carbide in an Acheson furnace comprising packing the silica and coke ingredients forming a reaction mix around a centrally disposed resistive element heat source while confining the mix between gates that hold the mix in an insulated zone surrounding said source, supplying current to said source for raising the temperature within the mass to about 1800° C. for reacting all of the ingredients in the mix between the heat source and the gates to form finely crystalline silicon carbide, and then increasing the crystal size of the silicon carbide in the reacted mass by increasing the temperature of the reacted mass between the heat source and the gates to a temperature between 2000° C. to 2500° C.

4,419,337
PROCESS AND APPARATUS FOR REACTING SULPHUR-CONTAINING MATERIAL WITH OXIDIZING GAS

Richard F. Jagodzinski, and Richard K. Kerr, both of Calgary, Canada, assignors to Hudson's Bay Oil and Gas Company Limited and Alberta Energy Company Ltd., both of Alberta, Canada

Filed Jun. 19, 1981, Ser. No. 275,201
Claims priority, application Canada, Oct. 21, 1980, 362841
Int. Cl.³ C01B *17/04*; B01D *53/34*
U.S. Cl. 423—574 R **19 Claims**



1. A process for reacting hydrogen sulfide with oxygen comprising:

continuously introducing a gas containing at least 1% hydrogen sulfide and an oxidizing gas containing free oxygen into a reactor which contains a bed of solid catalyst through which the said gases pass and which causes the hydrogen sulfide to react with oxygen to produce sulfur dioxide;

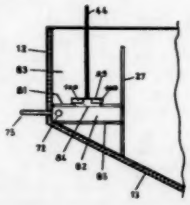
maintaining all the catalyst continuously saturated with liquid sulfur during the reaction by continual injection and removal of liquid sulfur; and,

maintaining and controlling within the reactor a temperature between about 275° and 550° C. and a pressure of at least 5 atmosphere absolute during the reaction.

4,419,338
LIQUID-LIQUID EXTRACTION

Achille De Schepper, Lichtaart, and Antoine Van Peteghem, Olen, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Division of Ser. No. 231,367, Feb. 3, 1981, abandoned, which is a division of Ser. No. 912,989, Jun. 6, 1978, Pat. No. 4,277,445. This application Dec. 29, 1981, Ser. No. 335,551
Claims priority, application Luxembourg, Jun. 7, 1977, 77498
Int. Cl.³ B01D *11/04*
U.S. Cl. 423—658.5 **2 Claims**



1. A multi-stage liquid-liquid extraction process for carrying

out extractions involving light and heavy phases accompanied by a solid phase settling comprising the steps of

(a) establishing a connected series of mixer-settler zones, each of said mixer-settler zones consisting of a mixing zone which empties into a settling zone,

(b) separately introducing into each mixing zone two liquid phases of different densities and separately removing from each settling zone two liquid phases of different densities,

(c) introducing a heavy liquid to be submitted to an extraction operation into the mixing zone of the first in the series of mixer-settler zones and withdrawing a heavy liquid that has been submitted to an extraction operation from the settling zones of the last in the series of said mixer-settler zones,

(d) introducing a light liquid phase which acts as extractant into the mixing zone of the last in the series of mixer-settler zones and withdrawing said light liquid phase from the settling zone of the first in the series of mixer-settler zones,

(e) withdrawing a heavier liquid fraction from each settling zone and passing it to the mixing zone of the next in the series of mixer-settler zones and finally removing it from the settling zone of the last of said mixer-settler zones,

(f) withdrawing a lighter liquid fraction from each settling zone and passing it to the mixing zone of the next previous mixer-settler zone in the series of mixer-settler zones,

(g) causing the mixed liquid phases exiting from each mixing zone to (a) first flow in one direction with an increase in the depth of the flowing body of liquid, which facilitates the settling of solids from the liquid phases, and (b) thereafter flow the liquid phases along a separate path in a direction which is generally opposite to said first direction and in such a manner that the depth of the liquid body decreases,

(h) withdrawing a light liquid fraction and a heavy liquid fraction adjacent the area where each settling zone reaches its minimum depth, and

(i) withdrawing solids adjacent the area where each settling zone reaches its maximum depth.

4,419,339

FORMULATION AND METHOD OF MAKING CATIONIC LIPOPHILIC COMPLEXES

Rudi D. Neirinckx, East Windsor, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 5, 1981, Ser. No. 290,268

Int. Cl.³ A61K *43/00, 49/00;* **C07F** *15/02, 1/08*

U.S. Cl. 424—1.1 **20 Claims**

1. A method for the preparation of a technetium-99m complex having the formula

$$[(L)_2{}^{99m}Tc(X)_2]^{\oplus}X^{\ominus},$$

which comprises adding technetium-99m to a complex having the formula

$$[(L)_2M(X)_2]^{\oplus}X^{\ominus}$$

and heating the mixture in the presence of a source of anion $X^{\ominus}$, wherein each L is the same or different lipophilic ligand, each X is the same or different monovalent anionic ligand, and M is a non-toxic trivalent metal ion other than technetium.

4,419,340

CONTROLLED RELEASE OF ANTICANCER AGENTS FROM BIODEGRADABLE POLYMERS

Seymour Yolles, Newark, Del., assignor to University of Delaware, Newark, Del.

Continuation of Ser. No. 859,766, Dec. 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 504,588, Sep. 9, 1974, abandoned, which is a continuation of Ser. No. 102,431, Dec. 29, 1970, Pat. No. 3,887,669, which is a continuation-in-part of Ser. No. 809,946, Mar. 24, 1969, abandoned. This application Nov. 20, 1980, Ser. No. 208,506

The portion of the term of this patent subsequent to Jun. 3, 1992, has been disclaimed.

Int. Cl.³ A61K *9/26, 31/74, 47/00*

U.S. Cl. 424—19 **3 Claims**

1. An implant drug dispensing device article for prolonged administration upon implantation of an anticancer agent which comprises, a solid shaped article formed from a combination of

(a) a biodegradable polymer selected from poly(lactic acid) or polyglycolic acid, and, substantially uniformly and intimately dispersed throughout portions of the article,

(b) cis-dichlorodiammine-platinum (II), and

(c) doxorubicin or cyclophosphamide each being present in administrable doseage being much larger than those normally toxic, to lower than are normally infused by injection, and having an average particle size of from 150 to 425 microns.

4,419,341

DRUG FOR TREATMENT OF DENTAL CARIES

Anatoly G. Kolesnik, Moscow; Galina I. Kadnikova, Riga; Lilia V. Morozova, Moscow, and Lidia M. Boginskaya, Moskovskaya, all of U.S.S.R., assignors to Rizhsky Meditsinsky Institut, Moscow, U.S.S.R.

Filed Mar. 4, 1983, Ser. No. 472,085

Int. Cl.³ A61K *7/18, 33/16, 35/32*

U.S. Cl. 424—52 **3 Claims**

1. A drug for treatment of dental caries, comprising an active principle, namely, a mixture of sodium monofluorophosphate and an anticaries composition obtained by treating osseous tissue with a diluted mineral acid till a complete dissolution of the mineral components and water-soluble proteins contained in the osseous tissue, separating the solution, diluting it with water, adding as a stabilizer, citric acid or its salt, to the solution, and neutralizing and evaporating the solution, which anticaries composition has the following percentage-by-weight composition:

calcium	2–6
sodium	19–23
potassium	0.04–0.18
mineral acid anions	6–10.6
orthophosphoric acid anions	1.5–5.0
water-soluble proteins	1.0–5.0
magnesium	0.05–0.2
trace elements, including fluorine, manganese, tin, zinc, and iron	0.01–0.02
complex citrate compounds in terms of citric acid anions	the balance;

and a chewable and swallowable water and saliva-soluble pharmaceutical diluent, the ratio between said active principle and said pharmaceutical diluent being 1:23.5–24.5.

4,419,342

DENTIFRICE PREPARATION

Harry Hayes, Warrington, and Kenneth Harvey, Wilmslow, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 356,674, Mar. 10, 1982, abandoned. This application Jan. 17, 1983, Ser. No. 458,244

Int. Cl.[3] A61K 7/16, 7/22

U.S. Cl. 424—54 5 Claims

1. An opaque dentifrice comprising a liquid vehicle which contains at least about 35% by weight of water, up to about 10% by weight of gelling agent, about 10–50% by weight of a polishing material at least a major portion of which is a siliceous polishing material having an empirical SiO_2 content of at least 70%, a particle size in the range from 1 to 35 microns, substantially amorphous X-ray structure and a refractive index of about 1.40–1.47 and as an additional polishing agent an amount of about 5–20% by weight of the dentifrice of a dentally acceptable polishing agent selected from the group consisting of calcined alumina, alpha-alumina trihydrate, dicalcium phosphate dihydrate, anhydrous dicalcium phosphate, insoluble sodium metaphosphate, calcium carbonate and mixtures thereof, said amount of said additional polishing agent not exceeding the amount of said siliceous polishing agent, about 0.1–5% by weight of a surface active agent containing sodium alkyl sulphate wherein the alkyl group contains 10–18 carbon atoms, with about 40–70% of the alkyl groups being C_{12} and about 0.1–15% by weight of a water soluble, orally acceptable salt of an alkylene diamine tetramethylene phosphonic acid, wherein the alkylene group contains 1–10 carbon atoms, said dentifrice being smooth and without substantial soft lump rheological deformation.

4,419,343

COMPOSITION USABLE NOTABLY AS A COSMETIC PRODUCT ALLOWING A TANNING OF THE SKIN COMPRISING THE USE OF AMINOACIDS

Marc Pauly, Chateau Salins, France, assignor to Laboratorios Serobiologiques S.A., France

Continuation of Ser. No. 84,019, Oct. 12, 1979, abandoned. This application Aug. 19, 1981, Ser. No. 294,402

Claims priority, application France, Oct. 19, 1978, 78 29797

Int. Cl.[3] C07C 143/00; A61K 7/42; C07D 233/64; C07C 83/00

U.S. Cl. 424—59 19 Claims

1. A composition for topical application to the epidermis to effect photo-pigmentation or photo-protection of skin upon exposure to the sun or ultra-violet rays, said composition comprising a skin photo-pigmentation or photo-protection effective amount of a salt of tyrosine with a basic aminoacid, distributed in a vehicle for topical application.

4,419,344

QUATERNARY, COPOLYMERIC, HIGH MOLECULAR WEIGHT AMMONIUM SALTS BASED ON ACRYLIC COMPOUNDS, THEIR PREPARATION, AND THEIR USE IN COSMETICS

Dieter Strasilla, Weil am Rhein, Fed. Rep. of Germany; Hubert Meindl, Riehen, Switzerland; Laszlo Moldovanyi, Basel, Switzerland, and Charles Fearnley, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

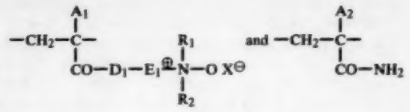
Filed Jul. 27, 1981, Ser. No. 286,920

Claims priority, application Switzerland, Aug. 1, 1980, 5876/80

Int. Cl.[3] A61K 7/08; C08F 28/02

U.S. Cl. 424—70 14 Claims

12. A method of hair treatment to give ease of wet and dry combing which comprises the step of applying a cosmetic which contains at least one copolymeric, quaternary ammonium salt which is soluble or forms a microemulsion in an aqueous surfactant system, which has a molecular weight distribution of 10^4 to 10^9, the molecular weight of at least 5 percent by weight of the copolymer being 10^7 and 10^9, and comprises, in any order, recurring structural elements of the formulae



in which A_1 and A_2 are each hydrogen or methyl, D_1 is oxygen or —NH—, E_1 is alkylene having 1 to 4 carbon atoms unsubstituted or substituted by hydroxyl, R_1 and R_2 are each methyl or ethyl, Q is alkyl or hydroxyalkyl having 1 to 4 carbon atoms or benzyl and $X^{\ominus}$ is the radical of at least one anionic sulfate ether surfactant, which may be zwitterionic.

4,419,345

SLEEP-INDUCING PHARMACEUTICAL COMPOSITION AND METHOD

Richard J. Wyatt, Bethesda, Md., assignor to Kinetic Systems, Inc., Arlington, Va.

Filed Jul. 20, 1981, Ser. No. 284,684

Int. Cl.[3] A61K 31/195, 33/06, 33/14

U.S. Cl. 424—153 8 Claims

5. A method for inducing sleep in warm blooded animals, comprising administering thereto a sleep-inducing effective amount of a combination of tryptophan, or a non-toxic salt thereof and a calcium cation wherein the weight ratio of the tryptophan or a non-toxic salt thereof to the cation is about 0.02:1 to 1.0:1.

4,419,346

METHOD AND COMPOSITION TO INHIBIT THE GROWTH OF *STREPTOCOCCUS MUTANS* BY THE USE OF SACCHARIN/FLUORIDE COMBINATION

John J. Stroz, Monroe, Conn., and Andrew M. Slee, Averill Park, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Aug. 13, 1982, Ser. No. 407,987

Int. Cl.[3] A61K 7/18, 9/68, 33/16

U.S. Cl. 424—151 5 Claims

1. In the method of inhibiting the growth of *Streptococcus mutans* by contacting *Steptococcus mutans* with a saccharin compound selected from the group consisting of sodium saccharin, ammonium saccharin, calcium saccharin, or the free acid form of saccharin in an amount sufficient to inhibit growth of *Streptococcus mutans*, the improvement comprising contacting *Streptococcus mutans* with said saccharin in synergistic combination with a fluoride material in an amount which inhibits or prevents growth of *Streptoccus mutans*.

4,419,347

NONAPEPTIDE AND DECAPEPTIDE ANALOGS OF LHRH, USEFUL AS LHRH ANTAGONISTS

John J. Nestor, San Jose; Gordon H. Jones, and Brian H. Vickery, both of Cupertino, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 194,180, Oct. 6, 1980, Pat. No. 4,341,767. This application Apr. 8, 1982, Ser. No. 366,635

The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.

Int. Cl.[3] A61K 37/00; C07C 103/52

U.S. Cl. 424—177 28 Claims

1. A compound of the formula

A—B—C—Ser—Tyr—X—Leu—Arg—Pro—E (I)

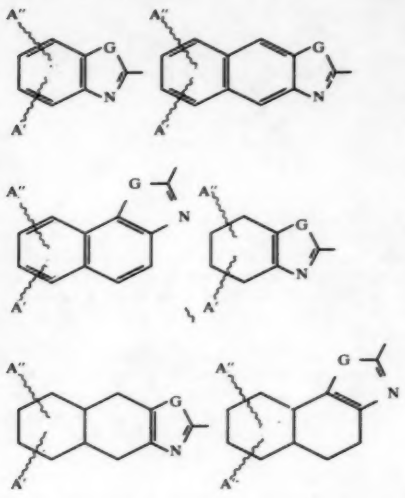
and the pharmaceutically acceptable salts thereof, wherein:

X is a D-alanyl residue wherein one hydrogen on C-3 is replaced by:

(a) a carbocyclic aryl-containing radical selected from the group consisting of phenyl substituted with three or more straight chain lower alkyl groups, naphthyl, anthryl, fluorenyl, phenanthryl, biphenylyl and benzhydryl; or

(b) a saturated carbocyclic radical selected from the group consisting of cyclohexyl sustituted with three or more straight chain lower alkyl groups, perhydronaphthyl, perhydrobiphenylyl, perhydro-2, 2-diphenylmethyl, and adamantyl; or

(c) a heterocyclic aryl containing radical selected from the group consisting of radicals represented by the following structural formulas:



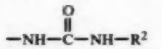
wherein A″ and A′ are independently selected from the group consisting of hydrogen, lower alkyl, chlorine, and bromine, and G is selected from the group consisting of oxygen, nitrogen, and sulfur;

A is an aminoacyl residue selected from the group consisting of L-pyroglutamyl, D-pyroglutamyl, N-acyl-L-prolyl, N-acyl-D-prolyl, N-acyl-D-tryptophanyl, N-acyl-D-phenylalanyl, N-acyl-D-p-halophenylalanyl, and N-acyl-X, wherein X is as defined previously;

B is a D-p-halophenylalanyl residue;

C is an amino acyl residue selected from the group consisting of L-tryptophanyl, D-tryptophanyl, D-phenylalanyl and X wherein X is as defined above;

E is glycinamide or —NH-R^1, wherein R^1 is lower alkyl, cycloalkyl, fluoro lower alkyl or



wherein R^2 is hydrogen or lower alkyl.

4,419,348

ANTHRACYCLINE GLYCOSIDE COMPOSITIONS, THEIR USE AND PREPARATION

Aquilur Rahman, Rockville, and Philip S. Schein, Bethesda, both of Md., assignors to Georgetown University, Washington, D.C.

Filed Apr. 27, 1981, Ser. No. 258,016

Int. Cl.³ A61K *31/70*; C07H *17/08*

U.S. Cl. 424—180 **15 Claims**

1. A cardiolipin complexed anthracycline glycoside compound encapsulated in liposomes formed from phosphatidyl choline, cholesterol and stearyl amine wherein said anthracycline glycoside is selected from the group consisting of doxorubicin, daunorubicin and pharmaceutically acceptable derivatives or salts thereof.

4,419,349

INTERFERON INDUCER, A PROCESS FOR PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Yasuhiko Kojima, Yokohama; Seishi Konno, Tokyo; Sadao Tamamura, Tokyo; Yoshimoto Sano, Tokyo; Nobuyuki Shibukawa, Tokyo, and Takashi Hashimoto, Chofu, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 97,609, Nov. 27, 1979, abandoned. This application May 22, 1981, Ser. No. 266,038

Claims priority, application Japan, Nov. 28, 1978, 53-146976; Sep. 6, 1979, 54-114623

Int. Cl.³ A61K *35/78*

U.S. Cl. 424—195 **13 Claims**

1. A process for producing a water soluble interferon inducer having a high molecular weight from a plant tissue, comprising extracting said interferon inducer with water from the tissue of a plant selected from the plants of the genus Perilla containing said interferon inducer at a temperature from ambient to the boiling point of the extraction mixture for a period of up to 5 days to extract said interferon inducer present in said tissue, forming a supernatant from the extracted solution, fractionating the supernatant to yield fractions containing the major portion of said interferon inducer in the supernatant and recovering said interferon therefrom.

4,419,350

CARBOFURAN COMPOSITIONS FOR PROBLEM SOILS

Peter E. Letchworth, Cupertino, and Thomas B. Williamson, Santa Clara, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 5, 1981, Ser. No. 318,295

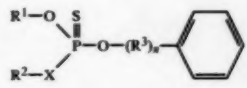
Int. Cl.³ A01N *43/08, 57/00*

U.S. Cl. 424—225 **10 Claims**

1. An insecticidal composition based on the insecticide 2,3-dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate for use in soil which has been previously treated with said insecticide and to which second or subsequent applications of said insecticide have produced a declining level of insecticidal activity, consisting essentially of

(a) an insecticidally effective amount of said insecticide, and

(b) an amount of an organophosphorus compound sufficient to restore at least a portion of the insecticidal activity of said insecticide, said organophosphorus compound having the formula



in which

R^1 is C_1–C_4 alkyl,

R^2 is C_1–C_4 alkyl,

R^3 is C_1–C_4 alkylene,

X is oxygen or sulfur, and

n is zero or one;

the weight ratio of insecticide to organophosphorus compound being about 1:1.

4,419,351

PLATINUM-DIOXOPYRIMIDINE COMPLEXES

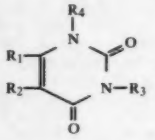
Barnett Rosenberg, Holt; Loretta Van Camp, East Lansing; Robert G. Fischer, Lansing, all of Mich.; Samir Kansy, Eugene, Oreg.; Henry J. Peresie, Lafayette, Ind., and James P. Davidson, Lansing, Mich., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 803,269, Jun. 3, 1977, abandoned, which is a continuation of Ser. No. 508,854, Sep. 24, 1974, abandoned. This application Dec. 18, 1978, Ser. No. 970,524

Int. Cl.[3] **A61K** *31/505*

U.S. Cl. 424—245 **8 Claims**

1. The blue or green platinum-[2,4-dioxopyrimidine] complex or the mixture thereof prepared by reacting a 2,4-dioxopyrimidine having the formula:



wherein

R_1 and R_2 may be the same or different and are selected from the group consisting of H, lower alkyl, di-lower alkyl amino, di-halo lower alkyl amino, halogen, hydroxy, hydroxy lower alkyl, carboloweralkoxy,

R_3 and R_4 may be the same or different and are selected from the group consisting of H, lower alkyl ribosyl, deoxyribosyl, ribosyl, triacetyl-, tribenzoyl- or 2',3' loweralkylidene ribosyl, ribosyl phosphates and deoxyribosyl phosphates or

a 5,6-2H derivative thereof

with cis-diaquodiammineplatinum(II) wherein the molar ratio of 2,4-dioxopyrimidine to cis-diaquodiammineplatinum(II) is from about 2:1 to about 1:1 at a temperature of from about 0° to about 55° C., a pH of from about 3 to about 8 and for a time sufficient to form said complex or mixture.

4,419,352

PYRANOQUINOLINONES AND ANALOGS THEREOF

David Cox; Hugh Cairns, both of Loughborough; Nigel Chadwick, West Bridford, and John L. Suschitzky, Loughborough, all of England, assignors to Fisons Limited, London, England

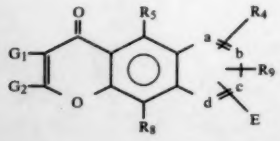
Continuation of Ser. No. 82,994, Oct. 9, 1979, abandoned. This application Feb. 20, 1981, Ser. No. 236,329

Claims priority, application United Kingdom, Oct. 31, 1978, 42679/78; Jun. 14, 1979, 7920760

Int. Cl.[3] **C07D** *491/04, 413/14;* **A61K** *31/535, 31/47*

U.S. Cl. 424—248.4 **31 Claims**

1. A compound selected from the group having the formulas



I

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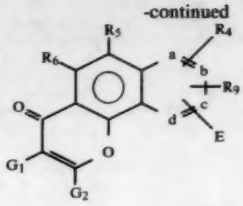
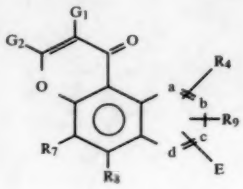


II



III

wherein

one of the atoms a and d is nitrogen and the other is carbon, and b and c are carbon,

R_4, R_5, R_6, R_7, R_8, and R_9, which may be the same or different, each represent hydrogen, alkyl, halogen, alkenyl, $—NO_2$, $—NR_1R_2$, $—OR_3$, $—S(O)_nR_3$; or alkyl substituted by hydroxy, amino, alkoxy or carbonyl oxygen,

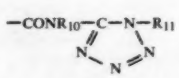
n is 0, 1 or 2,

R_1 and R_2, which may be the same or different, each represent hydrogen, alkyl, —CONHR$_3$, phenyl or phenyl substituted by alkyl or halogen, or R_1 and R_2 together with the nitrogen atom to which they are attached form a morpholine, piperidine or pyrrolidine ring,

R_3 represents hydrogen, alkyl, alkenyl or phenyl,

one of G_1 and G_2 is hydrogen and the other is a group E,

each E, which may be the same or different, is —COOH, a 5-tetrazolyl group, or a group having the formula



R_{10} and R_{11} are the same or different and are hydrogen, alkyl, alkenyl, phenylalkyl, alkanoyl, or alkoxy carbonyl, and R_{10} is hydrogen when R_{11} is hydrogen,

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, R_{10} and R_{11}, when they contain carbon, each containing up to 8 carbon atoms,

provided that when (i) either a or d is a carbon atom, (ii) E is in a position ortho to the N atom and is —COOH, a 5-tetrazolyl group or an unsubstituted (N-tetrazol-5-yl)carboxamido group, (iii) R_9 is hydrogen, (iv) G_1 is hydrogen and G_2 is a group E, and (v) R_5, R_6, R_7 and R_8 are selected from hydrogen, hydroxy, alkyl, halogen, alkenyl, alkoxy or $—NR_1R_2$, then R_4 is not an —OH group para to the N atom,

and pharmaceutically acceptable salts, and when E is —COOH, pharmaceutically acceptable lower alkyl esters, 2-(diethylamino)esters and lower alkanoyl-lower alkyl esters, and pharmaceutically acceptable unsubstituted or mono- or di-phenyl or C_1 to C_6 alkyl amides, thereof.

25. A pharmaceutical composition for treatment of a condition involving an antigen-antibody reaction or excess mucous secretion comprising a therapeutically effective amount of a compound according to claim **1**, as active ingredient, in combination with a pharmaceutically acceptable inert adjuvant, diluent or carrier.

4,419,353
ISOXAZOLYL INDOLAMINES

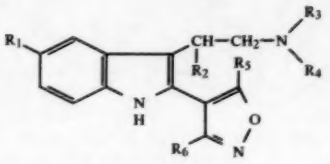
Leonard J. Brand, Randolph, and Jeffrey Nadelson, Denville, both of N.J., assignors to Sandoz, Inc., East Hanover, N.J.

Division of Ser. No. 245,188, Mar. 18, 1981, Pat. No. 4,336,379, which is a continuation-in-part of Ser. No. 196,785, Oct. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 138,872, Apr. 10, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 351,185

Int. Cl.[3] **A61K** *31/40, 31/42*

U.S. Cl. 424—248.4 **19 Claims**

1. A pharmaceutical composition useful in treating diabetes as a hypoglycemic agent comprising a compound of the formula:



(I)

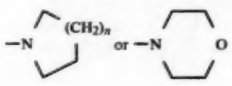
wherein

R_1 represents hydrogen, fluoro, chloro, lower alkyl having 1 to 4 carbon atoms, or lower alkoxy having 1 to 4 carbon atoms, and

R_2 represents hydroxy, and

R_3 and R_4 each independently represent lower alkyl having 1 to 4 carbon atoms, or

R_3 and R_4 together with N represent



wherein

n is 1, 2 or 3, and

R_5 and R_6 each independently represent hydrogen or lower alkyl having 1 to 4 carbon atoms,

or pharmaceutically acceptable acid addition salt thereof in association with a pharmaceutical carrier or diluent, said compound being present in an amount sufficient to provide a daily dose of 50 to 2000 milligrams of compounds.

4,419,354
9,10-BIS(AMINOALKOXY)ANTHRACENES

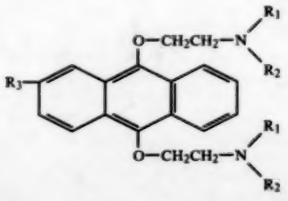
Ralph G. Child, Pearl River, and Stanley A. Lang, Jr., Blauvelt, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 3, 1982, Ser. No. 384,461

Int. Cl.[3] **A61K** *31/13, 31/535;* **C07C** *93/10;* **C07D** *265/30*

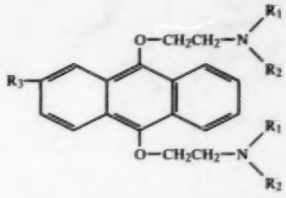
U.S. Cl. 424—248.56 **34 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R_1 and R_2 are the same or different and are hydrogen, alkyl having up to 3 carbon atoms or β-hydroxyethyl and R_1 and R_2 taken together with the associated N(itrogen) is morpholino, N-methyl piperazino, piperidino, 2-methyl piperidino, 3-methyl piperidino, 4-methyl piperidino, 4-piperidinol, 3,5-dimethyl piperidino, 3-piperidinemethanol, 3-piperidinecarboxylic acid ethyl ester or pyrrolidino; R_3 is hydrogen, methyl or chloro; and the pharmacologically acceptable acid-addition salts thereof.

33. A method of modulating the immune response in a mammal which comprises administering orally to said mammal an effective amount of a compound selected from the group consisting of those of the formula:



wherein R_1 and R_2 are the same or different and are hydrogen, alkyl having up to 3 carbon atoms or β-hydroxyethyl and R_1 and R_2 taken together with the associated N(itrogen) is morpholino, N-methyl piperazino, piperidino, 2-methyl piperidino, 3-methyl piperidino, 4-methyl piperidino, 4-piperidinol, 3,5-dimethyl piperidino, 3-piperidinemethanol, 3-piperidinecarboxylic acid ethyl ester or pyrrolidino; R_3 is hydrogen, methyl or chloro; and the pharmacologically acceptable acid-addition salts thereof.

4,419,355
CONDENSED AS-TRIAZINE DERIVATIVES AND METHOD OF USING THE SAME

Ibolya Kosoczky; Eva Toncsev, nee Ravasz; Pal Benko; Laszlo Pallos; Lujza Petocz; Sandor Batori; György Hajos; Andras Messmer, and Katalin Grasser, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

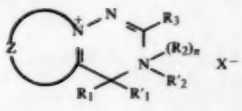
Filed Jul. 16, 1981, Ser. No. 283,971

Claims priority, application Hungary, Jul. 18, 1980, 179880

Int. Cl.[3] **C07D** *253/08;* **A61K** *31/53*

U.S. Cl. 424—249 **10 Claims**

1. A pharmaceutically acceptable salt of the formula (I)

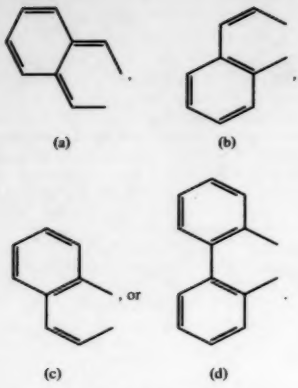


(I)

wherein

Z is a buta-1,3-dienyl group of the formula

or a group of the formula



R_1 is phenyl, halophenyl, or oxo;
R_2 is hydrogen or C_1 to C_4 alkyl;
R_3 is hydrogen or C_1 to C_4 alkyl;
X^- is a halide, perchlorate, p-toluene-sulfonate or methanesulfonate ion; and
in the case where R_1 is oxo, R_1' and R_2' represent nothing and n is 1; and
in the case where R_1 is other than oxo, R_1' and R_2' form an additional bond between the carbon and nitrogen atoms, and n is 0.

10. A method of treating depression in an animal subject which comprises the step of orally administering to said animal subject an anti-depressant effective amount of the salt defined in claim **1**.

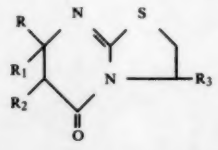
4,419,356

2,3,6,7-TETRAHYDROTHIAZOLO[3,2,a]PYRIMIDINE DERIVATIVES HAVING ANTI-RHEUMATIC PROPERTIES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Francois Debarre, Antony; Jean-Louis Fabre, Paris; Daniel Farge, Thiais, and Claude James, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jul. 22, 1981, Ser. No. 285,845
Claims priority, application France, Jul. 24, 1980, 80 16319; May 15, 1981, 81 09724
Int. Cl.³ A61K *31/505*
U.S. Cl. 424—251 **11 Claims**

1. A 2,3,6,7-tetrahydrothiazolo[3,2-a]-pyrimidine compound of the formula:



wherein R represents phenyl, alkyl of 1 through 4 carbon atoms, alkenyl of 2 through 4 carbon atoms or cycloalkyl of 3 through 6 carbon atoms and R_1 represents hydrogen, or R and R_1 each represent phenyl or unsubstituted alkyl of 1 through 4 carbon atoms, or R and R_1 together represent an alkylene radical of 4 or 5 carbon atoms, and R_2 and R_3 each represent hydrogen or an unsubstituted alkyl radical of 1 through 4 carbon atoms, or R and R_1 each represent hydrogen and one of R_2 and R_3 represents hydrogen and the other represents unsubstituted alkyl of 1 through 4 carbon atoms, or R_2 and R_3 both represent unsubstituted alkyl of 1 through 4 carbon atoms.

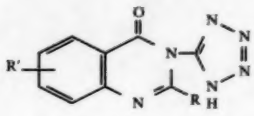
4,419,357

3-(1H-TETRAZOL-5-YL)-4(3H)-QUINAZOLINONES

Norton P. Peet, and Shyam Sunder, both of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

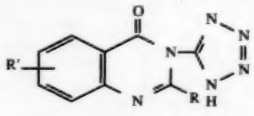
Filed Jan. 18, 1982, Ser. No. 340,577
Int. Cl.³ A61K *31/41, 31/505;* **C07D** *403/04*
U.S. Cl. 424—251 **11 Claims**

1. A compound of the formula:



wherein R is hydrogen, C_{1-4} lower alkyl or phenyl; R' is hydrogen, methyl, methoxy, halogen or the divalent group 6,7-methylenedioxy; and the pharmaceutically acceptable salts thereof.

8. A method for inhibiting the result of antibody-antigen reactions in mammals which comprises administration to a mammal susceptible to allergic reaction of an effective amount of a compound of the formula:



wherein R is hydrogen, C_{1-4} lower alkyl or phenyl; R' is hydrogen, methyl, methoxy, halogen or the divalent group 6,7-methylenedioxy; and the pharmaceutically acceptable salts thereof.

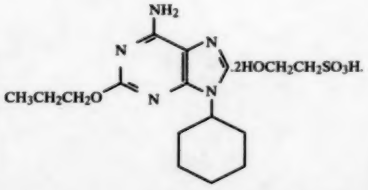
4,419,358

ISETHIONIC ACID SALT OF 9-CYCLOHEXYL-2-PROPOXY-9H-PURINE-6-AMINE AND COMPOSITIONS CONTAINING AN EFFECTIVE BRONCHODILATING CONCENTRATION OF IT

John D. Catt, and Davis L. Temple, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Nov. 12, 1981, Ser. No. 320,357
Int. Cl.³ A61K *31/52;* **C07D** *473/18*
U.S. Cl. 424—253 **4 Claims**

1. The di-2-hydroxyethanesulfonate salt of 9-cyclohexyl-2-propoxy-9H-purine-6-amine (I)



(I)

2. The salt of claim **1** in dilute solution suitable for bronchial application comprising a liquid pharmaceutical carrier containing an effective bronchodilating concentration of said salt.

4,419,359

NITRO-SUBSTITUTED POLYCYCLIC DERIVATIVES USEFUL IN THE TREATMENT OF PSORIASIS

Tibor Keve; Gyorgy Fekete; Csaba Lörincz, all of Budapest; Janos Galambos, Erd; Bela Zsadon, Budapest; Maria Zajer nee Balazs, Budapest; Lilla Forgach, Budapest; Egon Karpati, Budapest; Arpad Kiraly, Budapest; Gyongyver Kiraly nee Soos, Budapest; Laszlo Szporny, Budapest, and Bela Rosdy, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Budapest, Hungary

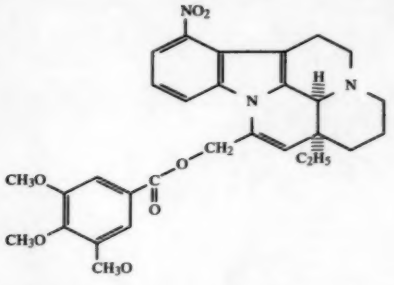
Filed Feb. 4, 1982, Ser. No. 345,631

Claims priority, application Hungary, Feb. 11, 1981, 323/81

Int. Cl.³ A61K *31/435;* C07D *461/00*

U.S. Cl. 424—256 10 Claims

1. (−)-9-nitro-apovincaminol-3′,4′,5′-trimethoxy-benzoate of the Formula Ia



Ia

or a pharmaceutically acceptable acid addition salt thereof.

6. A method for the treatment and prophylaxis of psoriasis which comprises the step of treating the affected skin surface with a pharmaceutically effective amount of the (−)-9-nitro-apovincaminol-3′,4′,5′-trimethoxy-benzoate or a pharmaceutically acceptable salt thereof, as defined in claim 1.

4,419,360

ARTHROPOD REPELLANTS

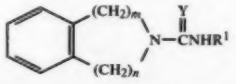
Joel R. Smolanoff, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 31, 1979, Ser. No. 90,156

Int. Cl.³ C07D *215/16;* A61K *31/47, 31/55, 31/40*

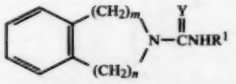
U.S. Cl. 424—258 7 Claims

1. A method for repelling arthropods which comprises applying an effective amount of a compound of the formula:



wherein R^1 is hydrogen, lower alkyl of from 1 to 9 carbon atoms, lower alkenyl of from about 2 to 5 carbon atoms, or lower alkoxy lower alkyl wherein the alkyl or alkoxy have from 1 to 6 carbon atoms; Y is O or S; m is an integer of 1 to 3 and n is an integer of 0 to 1.

6. A compound of the formula:



wherein R^1 is lower alkenyl of from 2 to 5 carbon atoms or lower alkoxycarbonyl lower alkyl wherein the alkyl or alkoxy have from 1 to 6 carbon atoms; Y is O or S; m is an integer of 1 to 3 and n is an integer of 0 to 1.

4,419,361

COMBATING FUNGI WITH 1-PHENOXY -1-IMIDAZOL-1-yl-4-FLUORO-BUTANE DERIVATIVES

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Wuppertal; Jörg Stetter, Wuppertal; Paul-Ernst Frohberger, Leverkusen; Wilhelm Brandes, Leichlingen, and Hans Scheinpflug, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

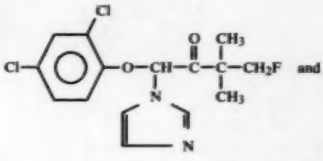
Continuation of Ser. No. 142,536, Apr. 21, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 321,642

Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918893

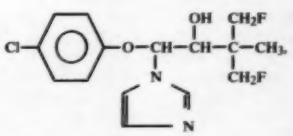
Int. Cl.³ A01N *43/50;* C07D *233/60*

U.S. Cl. 424—273 R 6 Claims

1. A 1-phenoxy-1-imidazol-1-yl-4-fluoro-butane derivative selected from the group consisting of



and



or an acid adduct thereof.

5. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound or adduct according to claim 1.

4,419,362

IMIDAZALYLALKYLTHIOIMIDAZOLES

Roger Crossley, and Kay H. Dickinson, both of Reading, England, assignors to John Wyeth and Brother Limited, Maidenhead, England

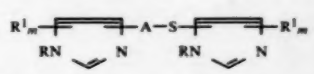
Division of Ser. No. 217,925, Dec. 18, 1980, Pat. No. 4,343,805, which is a continuation of Ser. No. 98,421, Nov. 29, 1979, abandoned. This application Feb. 24, 1982, Ser. No. 351,836

Claims priority, application United Kingdom, Dec. 16, 1978, 48813/78

Int. Cl.³ A61K *31/415;* C07D *403/12*

U.S. Cl. 424—273 R 7 Claims

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R^1 is hydrogen, lower alkyl, hydroxyloweralkyl, loweralkoxyloweralkyl, loweralkoxy, halogen, formyl, phenyl, phenylalkyl of 7 to 12 carbon atoms, or $CH(OR^4)_2$ where R^4 is lower alkyl or two R^4 radicals are joined to form a lower alkylene chain; A is a saturated alkylene of 1 to 6 carbon atoms which may be substituted by lower alkyl of 1 to 6 carbon atoms or $—CH{=}CHCH_2$; S is sulfur; or a pharmaceutically acceptable acid addition salt thereof; with the proviso that:

(1) at least one substituent R is lower alkyl, and

(2) when more than one R^1 radical is present in the molecule then the R^1 radicals may be the same or different.

4,419,363

ALKANOLAMINE DERIVATIVES

Leslie H. Smith, Macclesfield, England, assignor to Imperial Chemical Industries PLC, London, England

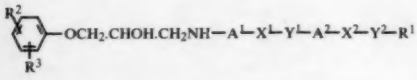
Continuation of Ser. No. 215,874, Dec. 12, 1980, Pat. No. 4,346,111, which is a division of Ser. No. 98,933, Nov. 30, 1979, Pat. No. 4,318,921, which is a division of Ser. No. 839,568, Oct. 5, 1977, Pat. No. 4,211,878. This application Jun. 4, 1982, Ser. No. 385,259

Claims priority, application United Kingdom, Oct. 7, 1976, 41714/76

Int. Cl.[3] **A61K** *31/34, 31/38;* **C07D** *333/24, 305/14*

U.S. Cl. 424—285 **10 Claims**

1. An alkanolamine derivative selected from the group consisting of a compound of the formula:



wherein A^1 is alkylene of from 2 to 6 carbon atoms; wherein A^2 is a direct link or alkylene of up to 6 carbon atoms; wherein R^1 is 5 or 6-membered saturated or unsaturated monocyclic heterocyclic containing one or two heteroatoms selected from nitrogen, oxygen or sulphur atoms, which heterocyclic is unsubstituted or contains one or two substituents selected from alkyl and alkoxy each of up to 6 carbon atoms and, where the heterocyclic bears an appropriate degree of saturation, one or two oxo substituents; wherein R^2 and R^3, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro, carbamoyl, cyano or alkyl, alkenyl, alkoxy, alkylthio, alkenyloxy, alkanoyl or acylamino each of up to 6 carbon atoms, or wherein R^2 and R^3 together form trimethylene, tetramethylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl or naphthyl; wherein X^1 is amidic of the formula —NHCO— and X^2 is amidic of the formula —CONH—; wherein Y^1 is a direct link and wherein Y^2 is a direct link, or alkylene or alkyleneoxy each of up to 6 carbon atoms; and the non-toxic pharmaceutically-acceptable acid-addition salts thereof.

4,419,364

BRONCHOSPASMOLYTIC CARBAMATE DERIVATIVES

O. A. Torsten Olsson; Leif A. Svensson, both of Lund, and Kjell I. L. Wetterlin, S Sandby, all of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

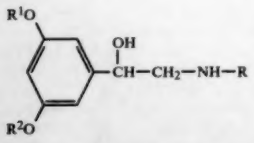
Filed Jul. 1, 1981, Ser. No. 279,672

Claims priority, application United Kingdom, Sep. 7, 1980, 8022439; May 29, 1981, 8116441

Int. Cl.[3] **A61K** *31/27;* **C07C** *125/067, 125/075*

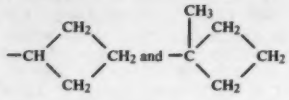
U.S. Cl. 424—300 **19 Claims**

1. A compound of the formula



I

and therapeutically acceptable salts thereof, in which formula R is selected from the group consisting of $—C(CH_3)_3$,

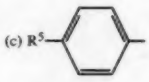


R^1 is selected from the group consisting of H and R^2, R^2 represents the radical of the formula

wherein R^3 is selected from the group consisting of

(a) H

(b) alkyl groups containing 1–3 carbon atoms



wherein R^5 is selected from the group consisting of

(a) OH

(b) alkoxy groups containing 1–3 carbon atoms and wherein R^4 is selected from the group consisting of

(a) H

(b) alkyl groups containing 1–3 carbon atoms with the proviso that R^3 and R^4 are combined as follows:

when R^3 is	then is R^4
H	H
alkyl group of 1–3 carbon atoms	H or an alkyl group of 1–3 carbon atoms
	H

4,419,365

METHOD OF TREATING ALZHEIMER'S DISEASE

Donald R. McLachlan, Toronto, Canada, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,794

Int. Cl.[3] **A61K** *31/16*

U.S. Cl. 424—320 **6 Claims**

1. A method of treating Alzheimer's disease which comprises parenterally administering to a person requiring such treatment an aqueous solution of about 0.2 to about 5.0 daily of a pharmaceutically acceptable acid addition salt of deferoxamine.

4,419,366
USE OF N-(6 AMINOHEXYL)-5-CHLORO-1-NAPHTHALENESULFONAMIDE, N-(6 AMINOHEXYL)-5-CHLORO-2-NAPHTHALENESULFONAMIDE, OR N-(6 AMINOHEXYL)-5-BROMO-2-NAPHTHALENESULFONAMIDE IN THE UTERUS TO PREVENT PREGNANCY

Milton J. Cormier, Bogart, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Division of Ser. No. 253,567, Jul. 6, 1981, Pat. No. 4,377,577, which is a continuation-in-part of Ser. No. 155,800, May 30, 1980. This application Jul. 14, 1982, Ser. No. 398,849

Int. Cl.³ A61K *31/18*

U.S. Cl. 424—321 **8 Claims**

1. A method of preventing pregnancy in a female which comprises introducing an effective amount of the drug N-(6 aminohexyl)-5-chloro-1-naphthalenesulfonamide, N-(6aminohexyl)-5-chloro-2-naphthalenesulfonamide, or N-(6 aminohexyl)-5-bromo-2-naphthalenesulfonamide directly into the uterus of the female after sexual intercourse.

4,419,367
STIMULANT

Shabtay Dikstein, and Mark Segal, both of Jerusalem, Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

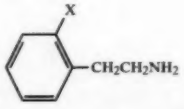
Filed Feb. 22, 1980, Ser. No. 123,881

Claims priority, application Israel, Feb. 27, 1979, 56755

Int. Cl.³ A61K *31/135*

U.S. Cl. 424—330 **4 Claims**

1. A method for stimulating the sex drive in mammals, comprising administering an effective amount of a compound of the formula



wherein X comprises a methoxy or methylthio group, or a pharmaceutically acceptable acid addition salt thereof.

4,419,368
NAPHTHOQUINONE ANTI-PSORIATIC AGENTS

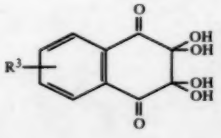
Gordon H. Jones, Cupertino, and John Young, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 144,479, Apr. 28, 1980, abandoned, which is a division of Ser. No. 912,697, Jun. 5, 1978, Pat. No. 4,229,478. This application Nov. 2, 1981, Ser. No. 317,645

Int. Cl.³ A61K *31/12*

U.S. Cl. 424—331 **10 Claims**

1. A pharmaceutical composition in a form suitable for topical administration to mammals which comprises a pharmaceutically acceptable, non-toxic carrier and a psoriasis-relieving amount of a compound represented by the formula



wherein

R^3 is selected from the group consisting of halo, cyano, alkoxy of one to eighteen carbon atoms and $—S(O)_nR$ wherein n is 0, 1 or 2; and

R is selected from the group consisting of alkoxycarbonylalkyl wherein alkoxy contains one to four carbon atoms and the alkyl chain contains one to eighteen carbon atoms; alkyl of one to eighteen carbon atoms; phenylalkyl wherein the alkyl group contains one to eighteen carbon atoms and the phenyl ring is optionally substituted by one or more lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms, halo or lower acyl of two to seven carbon atoms; phenyl optionally substituted by one or more halo, cyano, nitro, amino, acylamino of two to five carbon atoms, lower alkoxy of one to four carbon atoms or lower alkyl of one to four carbon atoms; and heterocyclic aryl or the pharmaceutically acceptable salt thereof, said aryl having 3 to 9 ring carbon atoms and having in the ring one or two heteroatoms selected from the group consisting of nitrogen, oxygen and sulfur.

4,419,369
PROTEIN MINERAL DIETARY MODULE

Buford L. Nichols, Jr., Houston, Tex.; William J. Klish, Rochester, N.Y., and Vivian E. Potts, Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation-in-part of Ser. No. 189,269, Sep. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 83,187, Oct. 9, 1979, abandoned. This application Sep. 1, 1982, Ser. No. 414,085

Int. Cl.³ A23J *3/00*; **A23L** *1/30*

U.S. Cl. 426—2 **7 Claims**

1. In a dietary protein mineral module, to which fat and carbohydrates are added to patient's tolerance, consisting essential of protein and minerals combined such that when mixed with water to provide a protein concentration of 2.2 gm/100 cc final volume in water will provide normal mineral requirements of a patient, the protein being present in an amount of from about 70% to about 90% dry weight, and the minerals comprising by dry weight from about 1.0% to about 4.0% calcium, from about 0.5% to about 2.0% sodium, from about 0.1% to about 0.5% magnesium, and trace amounts of iron, zinc, copper, iodine and L-methionine, the improvement comprising,

including in the minerals from about 0.5% to about 2.0% chloride and from about 1.0% to about 4.0% phosphorus.

4,419,370
FISH CANNING PROCESS

Masanobu Yamamoto, North Vancouver, Canada, assignor to B. C. Research Council, Vancouver, Canada

Continuation-in-part of Ser. No. 124,553, Feb. 25, 1980, abandoned. This application Dec. 1, 1981, Ser. No. 326,357

Int. Cl.³ A22C *25/00*; **A23L** *1/325*

U.S. Cl. 426—7 **17 Claims**

1. In a fish canning process comprising the steps:

(a) separating the edible and inedible parts of the fish;

(b) placing the edible parts in a container;

(c) adding salt to each container;

(d) applying a lid to the container;

(e) forming a vacuum in the container;

(f) sealing the lid on the container; and

(g) heating the container sufficient to cook the fish, the improvement that comprises applying to the fish in the container 2 to 40 milligrams per ½ pounds of fish of a proteolytic enzyme having a proteolytic activity of 0.5 to 3.0 as related to the increase brought about per milligram of protein in the optical absorbency at 280 nm by trichloroacetic acid-soluble digestion products of casein, under standardized conditions according to Arnon, 1970, *Methods of Enzymology*, Academic Press, Volume XIX 226, the milligrams of enzyme and the corresponding specific activity to be in combination such that the total proteo-

lytic activity calculated as the product of specific activity and milligrams of protein is in the range of 1 to 38 optical absorbency units, and for a time in the range 5 to 90 minutes prior to the cooking step whereby curd formation on the surface of the cooked fish is reduced.

4,419,371

PACKAGED TOPPING FOR SALADS AND THE LIKE

Darrel R. Suderman, Middleburg Heights, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,507

Int. Cl.³ A23L *1/176, 1/226, 1/22*

U.S. Cl. 426—94 **9 Claims**

1. An improved, packaged, non-frozen topping capable of storage at ambient temperature, and immediate use after storage, comprising

a plurality of edible deep-fat fried, batter-coated fibrous vegetable pieces, said vegetable pieces being of the type which cook to a non-mealy crisp cellular structure when deep fat fried; and blended therewith

an effective amount of edible, crisp, cellular, farinaceous pieces effectively interspersed with the vegetable pieces for rendering the topping resistant to clumping;

said topping being readily pourable from the container therefor.

4,419,372

SIMULATED RAWHIDE PRODUCT

C. Lawrence Greene, Boulder Creek, Calif.; David C. Creech, Farmers Branch, and Donald W. Kelley, Garland, both of Tex., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Mar. 19, 1982, Ser. No. 360,077

Int. Cl.³ A23J *3/00*

U.S. Cl. 426—104 **19 Claims**

10. A process for preparing a simulated rawhide product comprising the steps of

(a) admixing ingredients including protein which comprises from 30 to 60 weight percent ground, defatted protein-containing oil seed, from 10 to 50 weight percent water, from 5 to 30 weight percent polyol plasticizer, and from 0.1 to 4 weight percent lecithin;

(b) heating the admixture obtained at an elevated pressure and temperature above 100° C. which is sufficient to convert it to a flowable mass and extruding the flowable mass while reducing its surface temperature below 100° C. before it is exposed to atmospheric pressure; and

(c) impacting the extruded mass with a stream of solid particles while maintaining it at a temperature within the range of from 25° to 90° C. until an opaque, rawhide-like surface appearance is obtained, the particles having a hardness greater than the hardness of the extruded mass surface and the stream of particles having an impact angle of from 35 to 90 degrees with the extruded mass surface.

4,419,373

METHOD OF HEATING CONTENTS IN A SELF VENTING CONTAINER

Walter J. Oppermann, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Mar. 29, 1982, Ser. No. 363,072

Int. Cl.³ B65D *81/34*

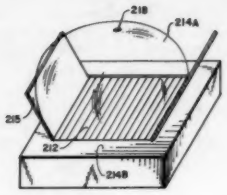
U.S. Cl. 426—234 **9 Claims**

1. A method of heating a package of material wherein the material is contained within a closed and sealed packaging structure, the material being capable of generating moisture vapor from a substance contained therein when the temperature of said material is raised, the method comprising the steps of:

(a) enclosing said material in a sealed packaging structure wherein at least a portion of said packaging structure comprises an extensible plastic film, at least a portion of said film having a route devoid of barriers between said film and said material;

(b) configuring said package so that at least a portion of said film is devoid of barriers to displacement of said film away from said material; and

(c) applying thermal energy to said material, causing substantial vaporization of said substance, such that said plastic film is displaced by said vapor away from said material,



and such that, said film being at least 80% ionomer, after said film is displaced from said material, a vent hole appears at an unselected location in said film for venting said vapor without substantial rupture of said film as a whole.

4,419,374

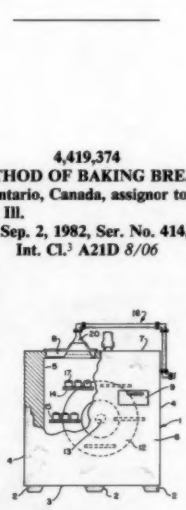
METHOD OF BAKING BREAD

David C. T. Pei, Ontario, Canada, assignor to Bettendorf Stanford Inc., Salem, Ill.

Filed Sep. 2, 1982, Ser. No. 414,401

Int. Cl.³ A21D *8/06*

U.S. Cl. 426—243 **5 Claims**



1. In the process of baking proofed loaves of bread in an oven wherein a substantially uniform hot air heat in the range of 300° to 500° F. is applied to said loaves constantly throughout the baking process and the loaves are subjected to microwave energy through a portion of said process, the improvement comprising, relative to a standard one pound loaf, first heating said loaves with said hot air alone for a period of about 1 to 1.5 minutes; second, exposing said loaves to microwave power in the amount of about 0.5 to 1.7 KW per loaf for a period of about 1.0 to 1.5 minutes, and third, exposing said loaves to said hot air substantially alone for a total heating period in said oven of about 8 minutes.

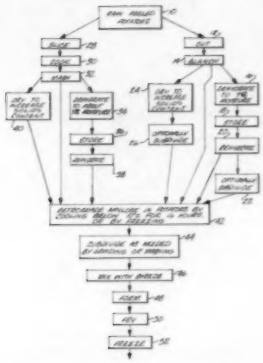
4,419,375
PROCESS FOR FORMING A POTATO PATTY

Miles J. Willard, P.O. Box 2774, Idaho Falls, Id. 83401, and William J. Englar, Moses Lake, Wash., assignors to Miles J. Willard, Idaho Falls, Id.

Continuation of Ser. No. 130,600, Mar. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 84,447, Oct. 12, 1979, abandoned, which is a continuation of Ser. No. 962,899, Nov. 22, 1978, abandoned, which is a continuation of Ser. No. 871,150, Jan. 20, 1978, abandoned. This application Jan. 15, 1982, Ser. No. 339,328

Int. Cl.³ A23L *1/216*

U.S. Cl. 426—272 **30 Claims**



1. A process for preparing a formed potato product capable of being deep-fat fried, comprising the steps of:

(1) preparing potato shreds;

(2) preparing a natural potato binder by heat-treating potatoes to gelatinize the starch naturally present in the potatoes, holding the heat-treated potatoes at a temperature of about 50° F. for at least about 16 hours, or at a lower temperature above freezing for a proportionately shorter holding time but for at least about 8 hours, or at a potato freezing temperature, so that the starch naturally present in the potato cells is extensively retrograded, and finely dividing the retrograded potatoes to rupture the potato cells and release the gelatinized starch naturally present in the potato cells, thereby producing a finely divided natural potato binder in which the gelatinized starch released from the potato cells has been retrograded sufficiently to form a non-sticky natural potato binder; and then

(3) mixing the potato shreds with the natural potato binder to form a potato patty capable of being deep-fat fried.

4,419,376
PROCESS FOR TREATING SOLID FOODSTUFF PIECES IN A CONTAINER

Albert C. Hersom, Beaconsfield; Kenneth W. Wright, Twyford, and John E. Brittain, Penn, all of England, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Oct. 20, 1981, Ser. No. 312,957

Claims priority, application United Kingdom, Nov. 14, 1980, 8036671

Int. Cl.³ A23L *3/16*; B65B *1/20, 55/14*

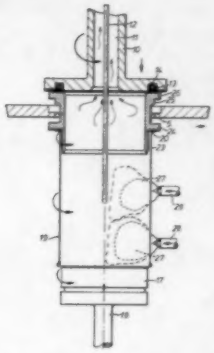
U.S. Cl. 426—402 **16 Claims**

1. A process for treating solid foodstuff pieces in a container which is to be hermetically sealed comprising:

(a) extending the container by providing an extension piece to engage with the container;

(b) adding solid foodstuff pieces to the container to fill the height of said container and at least part of the extension piece above the rim of said container;

(c) providing a closing member to engage with the extended container to form a closed assembly which contains an outlet for the escape of air;



(d) purging the solid foodstuff pieces with steam which reaches the interstices between the said pieces until the desired degree of heat processing has been achieved and the foodstuff pieces shrink and subside from the extension piece into the container; and then

(e) removing and separating the extension piece and closing member from the container.

4,419,377
CAKE MIX CONTAINING A LIPOPHILIC EMULSIFIER SYSTEM

Larry O. Seward, and Bradley Warman, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 22, 1982, Ser. No. 360,756

Int. Cl.³ A21D *2/16*

U.S. Cl. 426—554 **12 Claims**

1. A culinary mix comprising:

(a) from about 30% to about 54% sugar and 22% to about 43% flour, the ratio of sugar to flour being from about 1:1 to about 1.7:1;

(b) leavening sufficient to produce from about 40 mm/lb to 195 mm/lb of carbon dioxide;

(c) from about 6% to about 17% shortening, said shortening comprising:

(i) 0% to about 90% oil or fat;

(ii) 10% to about 100% of an emulsifier consisting essentially of 13% to 68% monoglycerides, 10% to 55% propylene glycol monoesters, 4% to 40% polyglycerol esters, and 5% to 42% lactylated propylene glycol monoester or lactylated monoglycerides;

(d) the balance being conventional cake additives.

4,419,378
CREAM/ALCOHOL-CONTAINING BEVERAGES

Charles E. Rule, Lakewood, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,397

Int. Cl.³ C12G *3/06*

U.S. Cl. 426—592 **6 Claims**

1. A premixed homogenized cream or milk and alcohol containing beverage comprising:

alcohol and a cream or milk containing butterfat, milk solids, and water in commercial alcoholic drink preparation amounts wherein the alcohol and cream or milk are emulsified;

and an emulsifier having an HLB more than about 10 selected from the group consisting of polyglycerol esters of fatty acids, ethoxylated fatty acid esters and sugar esters, said emulsifier being present in the amount of about 0.14–0.7% by weight based on the entire weight of the alcohol/fat/water emulsion, effective to achieve emulsion stability, thus preventing phase separation.

4,419,379

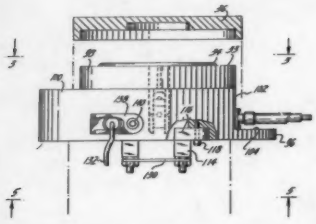
CRYSTAL PLATING METHOD

Alan Kaplan, West Caldwell, N.J., assignor to Emkay Manufacturing Company, East Hanover, N.J.

Continuation of Ser. No. 193,195, Oct. 6, 1980, abandoned, which is a division of Ser. No. 34,780, Apr. 30, 1979, Pat. No. 4,236,487. This application Apr. 19, 1982, Ser. No. 369,401

Int. Cl.³ B05D *3/14*

U.S. Cl. 427—10 **12 Claims**



1. A method of plating a crystal to adjust the frequency of oscillations of the crystal to a desired frequency comprising the steps of:

(a) placing the crystal in a holder with the surface of the crystal exposed;

(b) electrically connecting the crystal to the holder;

(c) masking the surface of the crystal to expose selected portions of the crystal for plating;

(d) placing the holder with the masked electrically connected crystal within a chamber in a base;

(e) electrically connecting the holder to an energizing and frequency circuit connected to the base;

(f) thereafter evacuating the chamber;

(g) energizing the base to cause said crystal to oscillate;

(h) depositing a plating material from a source within the chamber separate from said holder onto the exposed portions of the crystal while monitoring the frequency of oscillation of said crystal.

4,419,380

METHOD FOR ION-AIDED COATING ON ELECTRICALLY INSULATING SUBSTRATES

Helmut Bollinger; Bernd Bücken; Dietmar Schulze, and Rüdiger Wilberg, all of Dresden, German Democratic Rep., assignors to VEB Hochvakuum Dresden, Dresden, German Democratic Rep.

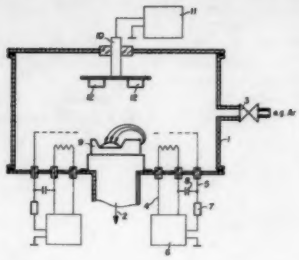
Filed Nov. 3, 1981, Ser. No. 317,817

Claims priority, application German Democratic Rep., Dec. 4, 1980, 225718

Int. Cl.³ B05D *1/00*

U.S. Cl. 427—38 **1 Claim**

1. Method for ion-aided coating of electrically insulating substrates characterized in that the plasma source, consisting of thermionic cathode (4) and anode (5), is operated with the anode voltage continuously alternating between an ignition voltage U_Z and an extinction voltage U_L at a frequency of



between several kHz and several hundred kHz, the thermionic cathode thereby continuously emitting electrons.

4,419,381

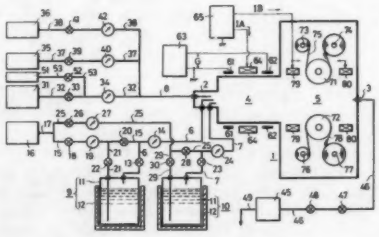
METHOD OF MAKING MAGNETIC MATERIAL LAYER

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1982, Ser. No. 338,870

Int. Cl.³ H01F *10/02*

U.S. Cl. 427—39 **11 Claims**



1. A magnetic material layer manufacturing method comprising the steps of:

disposing a base member in a reaction chamber between its gas inlet and gas outlet;

introducing a gas mixture of a raw material compound gas of halogenide or carbonyl of a first magnetic material selected from a group consisting of Fe, Ni and Co and a carrier gas of hydrogen into the reaction chamber from the gas inlet while exhausting gas from the reaction chamber through the gas outlet; and

applying plasma generating electrical energy to the gas mixture to produce in the reaction chamber a stream of plasma of the gas mixture, whereby a stream of active reaction products containing active particles of the first magnetic material is passed over the base member to deposit thereon amorphous or semi-amorphous particles of the first magnetic material, forming a magnetic material layer consisting principally of the amorphous or semi-amorphous particles of the first magnetic material.

4,419,382

PLASMA POLYMERIZED COLOR COATINGS

Francis A. Sliemers, Columubs, and Vincent D. McGinniss, Delaware, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Dec. 14, 1981, Ser. No. 330,098
Int. Cl.³ B05D 3/06
U.S. Cl. 427—40 4 Claims

1. A process for producing an adherent, colored-polymer coating on a substrate comprising

(A) coating a substrate with a layer of a plasma-reactive precursor and an additive comprising a dye, pigment or a material capable of reacting under plasma conditions to form a dye or pigment,

(B) introducing the coated substrate into plasma polymerization apparatus having a low-pressure environment comprising a plasma-forming inert gas,

(C) producing a glow discharge for a time sufficient to form a plasma from the inert gas and to initiate free radical formation, polymerization and crosslinking throughout the thickness of the plasma reactive precursor layer forming a partially cured coating on the substrate, and thereafter

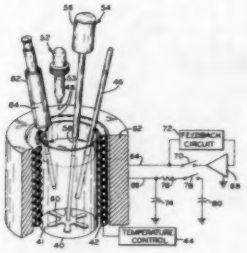
(D) heat treating the partially cured coating at a temperature and for a time sufficient to complete the cure reaction and increase the adherence of the coating to the substrate.

4,419,383

METHOD FOR INDIVIDUALLY ENCAPSULATING MAGNETIC PARTICLES

Lawrence L. Lee, Fort Wayne, Ind., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Division of Ser. No. 287,023, Jul. 27, 1981, which is a continuation-in-part of Ser. No. 106,793, Dec. 26, 1979, Pat. No. 4,283,438. This application Apr. 11, 1983, Ser. No. 483,668
Int. Cl.³ B05D 3/14
U.S. Cl. 427—47 15 Claims



1. A method for dispersing a preselected average number of magnetized particles, the particles being enclosed in a discrete amount of internal phase, comprising the following steps:

immersing the particles in a liquid internal phase;

suspending internal phase drops containing the immersed particles in a liquid continuous phase;

mechanically agitating the continuous phase to provide initial dispersing of said particles and forming smaller drops with a reduced number of particles in each drop;

applying a varying magnetic field to said suspension for further dispersing of said particles into smaller drops with a reduced number of particles in each drop, the frequency of said field variations being selected according to the desired number of particles in individual drops;

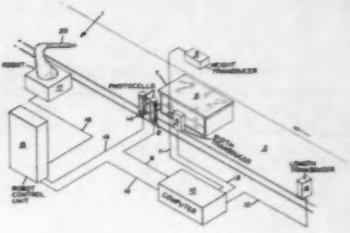
microencapsulating individual ones of said drops to form capsules containing drops in which said particles are rotatable.

4,419,384

APPARATUS AND PROCESS FOR ULTRASONICALLY IDENTIFYING AND COATING ARTICLES HAVING DIFFERING CHARACTERISTICS

John F. Kane, and Kerry L. Weinhold, both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 27, 1982, Ser. No. 423,664
Int. Cl.³ B05D 3/12
U.S. Cl. 427—57 2 Claims



1. A process utilizing ultrasonic identifying and control means, for coating articles having differing dimensional characteristics comprising:

(a) providing a means for moving a series of said articles past a predetermined point to work station;

(b) detecting the presence of each article when it reaches said predetermined point;

(c) generating ultrasonic waves from at least two transducers and impinging the waves on each article at said predetermined point to obtain reflected wave patterns from each article thereby to identify its dimensional characteristics;

(d) electronically comparing and matching the reflected wave patterns with similar numerically code-identified wave patterns in a data base to select a predetermined control sequence program for operating a numerically controlled pre-programmed means for coating each of said articles in accordance with its dimensional characteristics; and

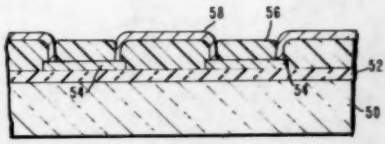
(e) electronically transmitting the identifying code numbers to the coating means to cause coating to be appropriately applied to each article when it arrives at the work station.

4,419,385

LOW TEMPERATURE PROCESS FOR DEPOSITING AN OXIDE DIELECTRIC LAYER ON A CONDUCTIVE SURFACE AND MULTILAYER STRUCTURES FORMED THEREBY

John W. Peters, Malibu, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 24, 1981, Ser. No. 305,009
Int. Cl.³ B05D 5/12; C23C 11/00; B32B 9/04
U.S. Cl. 427—99 9 Claims



1. A process for forming an effective insulating layer of an oxide of a chosen element on the surface of a substrate of a chosen conductive material comprising the step of exposing said surface to a chosen vapor phase reactant containing said chosen element in the presence of neutral atomic oxygen at a

temperature sufficiently low to minimize deformation of said surface of said substrate to thereby produce a reaction between said atomic oxygen and said reactant to form said oxide which deposits as a layer on said surface of said substrate, whereby said layer of said oxide exhibits relatively low pinhole density, relatively good surface morphology, and relatively good step coverage to thereby provide said effective insulating layer.

4,419,386

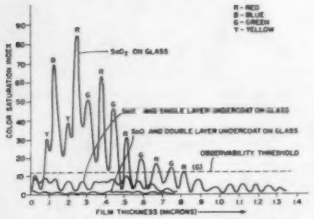
NON-IRIDESCENT GLASS STRUCTURES

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Division of Ser. No. 302,216, Sep. 14, 1981, Pat. No. 4,377,613. This application Aug. 30, 1982, Ser. No. 412,599

Int. Cl.³ C03C *17/23*

U.S. Cl. 427—109 **12 Claims**



1. A process for making a non-iridescent, transparent, structure of the type comprising

(A) a transparent substrate,

(B) an infra-red reflective coating thereon and

(C) an iridescence-suppressing interlayer between said substrate and infra-red-reflective coating, said process comprising the steps of forming, between said infra-red-reflective coating and said transparent substrate, an interlayer formed of two coatings

(1) a coating nearer to said substrate a first interlayer component of relatively high refractive index material;

(2) a coating over said relatively high refractive index material, a second interlayer component of relatively low refractive index material, and

(3) terminating each interlayer component at such a thickness that the combined interlayer components form said iridescence-suppressing means and the total optical thickness of said interlayer components is about 1/6th of a 500 nanometer design wavelength.

4,419,387

BORIC ACID HAVING IMPROVED HANDLING PROPERTIES

George W. Campbell, Hesperia, and Jerome T. Muench, Lancaster, both of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Feb. 2, 1982, Ser. No. 345,267

Int. Cl.³ B05D *7/00*

U.S. Cl. 427—215 **12 Claims**

1. The method of decreasing the lubricity of particulate boric acid which comprises contacting said particulate boric acid with an effective amount of gaseous ammonia at a temperature of about 0° to about 50° C., thereby providing boric acid particles of reduced lubricity having about 5 to 5000 ppm. ammonia chemically bonded to the surface thereof.

4,419,388

WATERPROOFING METHOD FOR INK JET RECORDS

Masatoshi Sugiyama; Ichiro Nakanishi, and Yoshiaki Suzuki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1981, Ser. No. 312,459

Claims priority, application Japan, Oct. 17, 1980, 55-145341

Int. Cl.³ B05D *5/00;* **B32B** *3/00, 27/14;* **G01D** *15/34*

U.S. Cl. 427—288 **18 Claims**

1. A waterproofing method for an ink jet record in a method of recording images on a recording sheet by an ink jet recording method using aqueous ink, comprising applying on at least the imaged portion of the recording sheet after forming images thereon, a compound represented by the formula

$$M^{I}M^{III}(XO_4)_2.12H_2O$$

wherein M^{I} represents a mono-valent metal atom or an ammonium group, M^{III} represents a tri-valent metal atom, and X represents a sulfur atom or a selenium atom.

4,419,389

METHOD FOR MAKING CARBON/METAL COMPOSITE PRETREATING THE CARBON WITH TETRAISOPROPYLTITANATE

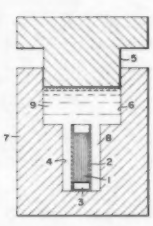
Tadashi Donomoto; Atsuo Tanaka; Masahiro Okada, all of Toyota; Atsushi Kitamura, Otsu, and Tetsuyuki Kyono, Kyoto, all of Japan, assignors to Toray Industries, Aichi and Toyota Jidosha Kabushiki Kaisha, Tokyo, both of, Japan

Filed Aug. 30, 1982, Ser. No. 413,126

Claims priority, application Japan, Sep. 3, 1981, 56-138854

Int. Cl.³ B05D *3/00;* **B32B** *5/14, 7/00*

U.S. Cl. 427—294 **11 Claims**



1. A method for manufacturing a composite material which includes carbon material in a matrix metal, comprising the step of combining said carbon material with said matrix metal, characterized in that before said step of combining said carbon material with said matrix metal, first a step is performed of applying tetraisopropyltitanate to said carbon material so as to wet it, and next a step is performed of drying said carbon material wetted with said tetraisopropyltitanate.

10. A method for manufacturing a composite material according to claim **1**, said carbon material being in the form of carbon fibers, wherein, in said step of applying tetraisopropyltitanate to said carbon material so as to wet it, said tetraisopropyltitanate is infiltrated into the carbon material by vacuum suction.

4,419,390

METHOD FOR RENDERING NON-PLATABLE SEMICONDUCTOR SUBSTRATES PLATABLE

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Division of Ser. No. 931,513, Aug. 7, 1978, Pat. No. 4,228,201, which is a continuation-in-part of Ser. No. 803,777, Jun. 6, 1977, Pat. No. 4,181,760. This application Sep. 29, 1980, Ser. No. 192,412

Int. Cl.³ C23C 3/02

U.S. Cl. 427—304 9 Claims

1. A process for rendering a non-platable substrate platable by conventional electroless plating, said process resulting in the deposition of metallic sites, said sites being catalytic to said conventional electroless plating, said substrate selected from the group consisting of silicon, germanium, and III-V compounds, comprising the step of immersing said non-platable substrate into a promoter composition wherein said promoter composition is a single composition which comprises a suitable reducing agent and primary metal ions selected from the group consisting of nickel, cobalt, and iron wherein said reducing agent is capable of chemically reacting with said non-platable substrate and said primary metal ions and further wherein the concentration of said reducing agent relative to said primary metal ions is so adjusted as to permit the initial chemical interaction of the reducing agent with the non-platable substrate and then the heterogeneous reduction of some of the primary metal ions present in the promoter composition, and further wherein said promoter composition also comprises other metal ions selected from the group consisting of tin, cadmium, zinc, thallium, and lead and mixtures thereof, said other metal ions being present in a lower concentration relative to said reducing agent and in a sufficient concentration to inhibit the growth of said metallic sites and further wherein said process is prior to conventional electroless plating.

4,419,391

METHOD OF IMPARTING IMPROVED TOUCH TO A FABRIC

Masaki Tanaka, Annaka, and Koichi Yamaguchi, Takasaki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

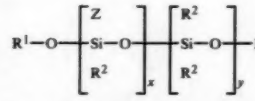
Filed Mar. 23, 1982, Ser. No. 361,036

Claims priority, application Japan, Mar. 31, 1981, 56-47547

Int. Cl.³ B05D 3/02

U.S. Cl. 427—387 4 Claims

1. A method for finishing a fabric to impart improved touch thereto which comprises soaking the fabric with a liquid composition containing an amino-containing organopolysiloxane represented by the general formula



in which R^1 is an alkyl group, R^2 is a monovalent hydrocarbon group having from 1 to 20 carbon atoms or a halogen-substituted group thereof, at least 50% by number of the groups denoted by R^2 being methyl groups, Z is an amino-substituted monovalent hydrocarbon group represented by the formula

$$-R^3—NH-R^3)NH-R^4,$$

R^3 being a divalent hydrocarbon group having from 1 to 5 carbon atoms, R^4 being a hydrogen atom, a monovalent hydrocarbon group having from 1 to 20 carbon atoms or a halogen-substituted group thereof and a being a number of 0, 1, 2 or 3, and x and y are each a positive integer, x+y being sufficiently large to give a viscosity in the range from 50 to 100,000 centistokes at 25° C. to the organopolysiloxane, and then heating the thus soaked fabric.

4,419,392

PROCESS FOR PRODUCING COMPACT LACQUER LAYERS FOR RECORD CARRIERS

Dietrich J. Bahr, Herrenberg, and Marian Briska, Böblingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 4, 1982, Ser. No. 385,152

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 81106496[U]

Int. Cl.³ B05D 1/36, 7/00; G01D 15/24

U.S. Cl. 427—404 5 Claims

1. A process for producing a record carrier comprising a substrate, an intermediate layer and a metallic or metalliferous overcoat layer, said process comprising the steps of coating the substrate with an intermediate layer which is a cellulose acetobutyrate based lacquer admixed with a filler which is a high-molecular weight polysaccharide having side chains and containing lignin, and having a particle size distribution of less than 10 μm and a molecular weight of about 10^6, and then coating said intermediate layer with a metallic or metalliferous layer.

4,419,393

METHOD AND APPARATUS FOR USE IN APPLYING A BAND OF LIQUID ADHESIVE

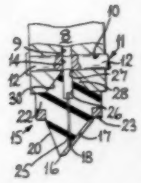
Raymond Hanson, Rearsby, England, assignor to USM Corporation, Farmington, Conn.

Filed May 14, 1982, Ser. No. 378,101

Claims priority, application United Kingdom, May 26, 1981, 8115976

Int. Cl.³ B05D 1/26

U.S. Cl. 427—430.1 14 Claims



1. A method of applying a band of liquid adhesive to a surface of a workpiece using an applicator head comprising:

providing a tapering applicator portion which is resiliently flexible and is provided with an adhesive-guiding surface which extends to a narrow terminal spreading surface of the applicator portion, the adhesive-guiding surface being partially cylindrical about an axis which extends transversely of the spreading surface, and an elongated orifice opening through the adhesive-guiding surface, and an extending generally parallel to the spreading surface;

supplying liquid adhesive to the orifice so that the adhesive flows through the orifice and down the adhesive-guiding surface to the spreading portion;

bringing the surface of the workpiece into contact with the spreading surface so that a pool of adhesive forms on the surface against the spreading portion;

causing the applicator portion to flex so that a portion of the adhesive-guiding surface extends along the surface of the workpiece; and

bringing about relative movement between the applicator portion and the surface so that the pool of adhesive is spread on the surface by the applicator portion.

4,419,394

CATALYST AND METHOD OF MAKING THE SAME

John M. Crone, Jr., Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,861
Int. Cl.³ B05D *1/18, 7/24*
U.S. Cl. 427—434.5 **6 Claims**

1. A method of coating an article comprising the steps of forming a coating solution by adding a sufficient quantity of an alumina gel to an alkali aluminate solution to effect a coating of an adherent alumina trihydrate film on a substrate upon the contacting of the substrate with said coating solution, said alumina gel comprising an amorphous precipitate formed by the reaction of aluminum sulfate and aqueous ammonium hydroxide at a pH of between about 6 and 8, said alumina gel not completely dissolving into said solution and not crystallizing out of said solution prior to forming said adherent alumina trihydrate film; and contacting a substrate with said coating solution for a period of time sufficient to form an adherent alumina trihydrate film on said substrate.

2. A method of coating an article comprising the steps of contacting a substrate with an alkali aluminate solution which does not substantially cost said substrate with an alumina trihydrate film; and adding a sufficient quantity of an alumina gel to the alkali aluminate solution to cause an adherent alumina trihydrate film to form on said substrate, said alumina gel comprising an amorphous precipitate formed by the reaction of aluminum sulfate and aqueous ammonium hydroxide at a pH of between about 6 and 8, and said alumina gel not completely dissolving into said solution and not crystallizing out of said solution prior to forming said adherent alumina trihydrate film.

4,419,395

PERFUMED PENDANT

Terutaka Sugimoto, 2-20-1 Nakazato, Kita-Ku, Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,101
Int. Cl.³ A44C *25/00;* **A61L** *9/04*
U.S. Cl. 428—28 **13 Claims**

1. A perfumed pendant suitable for use by infants comprising a front vinyl sheet having a design printed thereon, a back vinyl sheet having a design mating with said design on the front vinyl sheet printed thereon and welded at the outer peripheral edge thereof to the outer peripheral edge of said front vinyl sheet, a foam resilient padding interposed between said front and back vinyl sheets and a capsulated perfume layer laminated to the outer surface of said front vinyl sheet at a selected area of the sheet outer surface, said front and back sheets bulging outwardly.

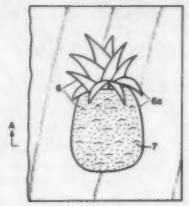
4,419,396

THREE-DIMENSIONAL PERFUMED SEAL

Terutaka Sugimoto, 2-20-1 Nakazato, Kita-ku, Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,102
Int. Cl.³ A61L *9/04;* **G09F** *3/00*
U.S. Cl. 428—40 **13 Claims**

1. A three-dimensional perfumed seal, suitable for use by infants, comprising a vinyl base sheet, an adhesive layer applied to one surface of said base sheet, a release paper applied to the surface of said adhesive layer opposite from said base sheet, a foam synthetic resin padding material disposed on the surface of said base sheet opposite from said adhesive layer, a covering vinly sheet sandwiching, said foam padding material between said covering sheet and said base sheet and said covering vinyl sheet bulging outwardly from said base sheet over the entire length thereof and having a design printed thereon and



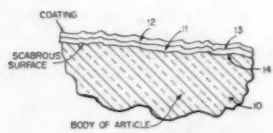
a transparent capsulated perfume layer applied to said design on the covering vinyl sheet, said base sheet, adhesive layer, foam padding material and covering vinyl sheet being welded together along the contour line of said design.

4,419,397

SCABROUS SURFACE LIGHT DIRECTOR

Clarence E. Neat, and Mark A. Neat, both of 6 Sundown Dr., Rolling Hills Estates, Calif. 90274

Filed Apr. 14, 1982, Ser. No. 368,048
Int. Cl.³ B32B *3/26, 15/08*
U.S. Cl. 428—141 **11 Claims**



1. A scabrous surface light director comprising:
a substrate possessing a scabrous surface; and
a reflective coating adhered to the surface of said substrate, said reflective coating comprising a laminated reflective film whose surface conforms to the texture of the substrate and comprises a thin layer of aluminum sandwiched between transparent films.

4,419,398

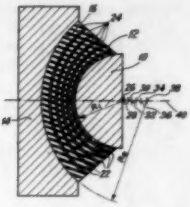
LAMINATED STOP OF CURVED SHAPE, PARTICULARLY FOR THE ROTORS OF HELICOPTERS

Rene L. Coffy, Sausset-les-Pins, and Jean J. E. Azeau, Gardanne, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Dec. 17, 1981, Ser. No. 331,787
Claims priority, application France, Dec. 26, 1980, 80 27593
Int. Cl.³ B32B *1/00*
U.S. Cl. 428—174 **6 Claims**

1. A laminated stop of curved shape having an axis of symmetry and comprising an inner fitting having a convex surface; an outer fitting having a concave surface; and, between the inner and outer fittings, layers of flexible material and layers of rigid material alternating therewith; wherein, in each axial plane, the mean radii of curvature of the successive layers of

flexible material increase more rapidly than the sum of the thicknesses measured from the inner fitting, so that each layer



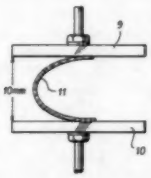
of flexible material has a thickness which increases in the direction away from the axis.

4,419,399

TRANSPARENT CONDUCTIVE FILM

Rinjiro Ichikawa, and Chiyoji Hitomi, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Jul. 6, 1981, Ser. No. 280,492
Int. Cl.³ B32B *7/02, 27/38*
U.S. Cl. 428—215 **9 Claims**



1. A transparent conductive film comprising a polymeric supporting substrate in the form of a film or sheet having a transparent conductive layer formed on one surface of said substrate wherein said substrate is optically isotropic, has a thickness of 5 to 1000 microns, a retardation value of not more than 30 millimicrons, a heat distortion temperature of not lower than 80° C., an average visible light transmittance of not less than 75%, a water vapor permeability of not higher than 30 g/24 hr·m², an Izod impact strength of not less than 1.5 kg-cm/cm and the degree of swelling on a surface having the transparent layer thereon of not more than 0.5% in a solvent.

4,419,400

PULTRUDED REINFORCED PHENOLIC RESIN PRODUCTS

Raymond R. Hindersinn, Lewiston, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 26, 1981, Ser. No. 315,097
Int. Cl.³ B29G *2/00, 7/00*; B32B *5/16, 27/42*
U.S. Cl. 428—245 **11 Claims**

1. In a pultruded, filament-reinforced product having a substantially uniform cross-section throughout its length and comprising (a) a filament component comprising a plurality of filaments and (b) a cured normally liquid resin interspersed around said filaments; the improvement wherein the liquid resin is a liquid phenolic resin having a viscosity in the range of about 500 to about 4,000 centipoises at 23° C., and a maximum volatile content of about 12 weight percent of volatile material having a boiling point of less than 120° C.

4,419,401

FIRE RETARDANT CONCENTRATES AND METHODS

Glenn A. Pearson, 3709 S. George Mason Dr., Falls Church, Va. 22041

Filed Aug. 3, 1982, Ser. No. 404,915
Int. Cl.³ B32B *7/00*; C08L *61/02*
U.S. Cl. 428—262 **15 Claims**

1. A concentrate comprising the reaction product of (a) about 35–65 parts by weight of ammonium phosphate, (b) about 10–30 parts by weight of ammonium sulfate, (c) about 40–60 parts by weight of an alkanolamine, (d) about 40–60 parts by weight of phosphoric acid, and (e) about 20–40 parts by weight of an aldehyde, said concentrate being contained in about 100–140 parts of water and forming flexible, hard non-burning coatings on substrates.

4,419,402

FLAME RETARDANT POLYORGANOPOLYSILOXANE RESIN COMPOSITIONS

Beth I. Gutek, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 349,214, Feb. 16, 1982, Pat. No. 4,404,305. This application Apr. 11, 1983, Ser. No. 483,998
Int. Cl.³ B32B *27/12*
U.S. Cl. 428—266 **13 Claims**

1. In an article of manufacture comprising a translucent fibrous substrate and a translucent coating on said substrate, said coating consisting essentially of a polyorganosiloxane resin and an effective amount of a flame retardant for said resin, the improvement comprising the presence in said resin of a flame retardant consisting essentially of from 1 to 10 parts by weight per 100 parts of said resin of an organic compound containing at least one halogen atom, selected from the group consisting of bromine and chlorine and from 5 to 150 parts by weight per 100 parts of said resin of glass particles having an average particle size of from 5 to 100 microns; the weight ratio of said organic compound to the glass particles being from 0.05 to 0.4.

4,419,403

WATER DISPERSIBLE PREMOISTENED WIPER

Eugenio Varona, Wilmington, Del., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Dec. 7, 1981, Ser. No. 328,305
Int. Cl.³ A61F *13/16*; D04H *1/58*; B32B *27/00*
U.S. Cl. 428—288 **6 Claims**

1. A water dispersible premoistened wiper comprising a nonwoven cellulosic fibrous web containing greater than 1% by weight of an alkali salt of a sulfated cellulose ester resin binder distributed in said fibrous web, said resin binder having a degree of saturation of about 2.5 to 3.0 sulfate groups per anhydrogluclose unit, and said web being impregnated with an aqueous solution of potassium ions in an amount effective to gel said sulfated cellulose ester resin binder.

4,419,404

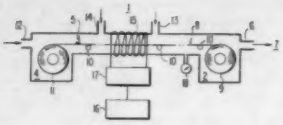
MAGNETIC RECORDING MEDIA AND PROCESS OF PRODUCING THEM

Yoshihiro Arai, and Akira Nahara, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanawaga, Japan

Filed Feb. 16, 1982, Ser. No. 348,883
Claims priority, application Japan, Feb. 16, 1981, 56-21652
Int. Cl.³ G11B *5/72*
U.S. Cl. 428—336 **5 Claims**

1. A magnetic recording medium, comprising:
a non-magnetic, flexible support;
a thin ferromagnetic metal layer formed on a surface of said support;
an overcoat layer formed on a surface of said ferromagnetic

metal layer, said overcoat layer comprising a fluorine-containing organic material, wherein the fluorine content of



said overcoat layer continuously and gradually increases in a direction away from said ferromagnetic metal layer.

4,419,405

ULTRAVIOLET LIGHT ABSORBING AGENTS AND COMPOSITIONS AND ARTICLES CONTAINING SAME

Bruce A. Ashby, and Siegfried H. Schroeter, both of Schenectady, N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 225,429, Jan. 15, 1981, Pat. No. 4,374,674, which is a division of Ser. No. 154,622, May 30, 1980, Pat. No. 4,278,804. This application Sep. 23, 1982, Ser. No. 421,798

Int. Cl.³ B32B *27/18, 27/30;* **C09K** *3/00*

U.S. Cl. 428—412 **12 Claims**

1. An article comprising:

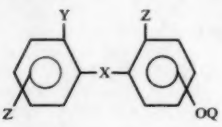
(A) a substrate,

(B) a primer layer on said substrate, and

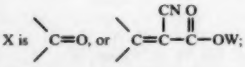
(C) a hard, protective coating over said primer layer and said substrate, said coating comprising an aqueous composition which comprises, before curing,

(a) a dispersion of a colloidal silica in a solution of the partial condensate of a silanol having the formula $RSi(OH)_3$, where R is selected from the group consisting of alkyl having 1 to 3 carbon atoms and aryl, at least 70 weight percent of which is $CH_3Si(OH)_3$, in a mixture of an aliphatic alcohol and water, said dispersion containing from 10 to 50 percent by weight of solids, said solids consisting essentially of 10 to 70 percent by weight of the colloidal silica and 30 to 90 percent by weight of the partial condensate, and

(b) an effective amount of an ultraviolet light absorbing agent comprising a compound having the formula



wherein:

X is  ;

Y is H or OH;

Z is H, OH, OQ or OW, where at least one Z is OH if Y is H;

Q is $-CH_2(CH_2)_nSi(R_2)_x(OR_1)_y$; and

W is $-C_mH_{2m+1}$;

where x=0, 1 or 2, y=1, 2 or 3 x+y=3, and R_1=alkyl or alkanoyl having 1 to 6 carbon atoms, R_2=alkyl having from 1 to 6 carbon atoms, n=0, 1, or 2 and m is 1 to 18.

4,419,406

MAGNETIC RECORDING MEDIUM AND PRODUCTION THEREOF

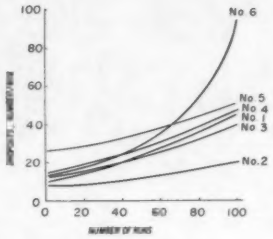
Yukihiro Isobe; Kazushi Tanaka; Masaharu Nishimatsu; Osamu Shinoura, and Yuichi Kubota, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,655

Claims priority, application Japan, Apr. 13, 1981, 56-54362

Int. Cl.³ B32B *27/00*

U.S. Cl. 428—422 **7 Claims**



1. A magnetic recording tape having a magnetic layer on one surface of a substrate and an anti-static backing layer on the opposite surface of said substrate, said magnetic recording tape produced by a process comprising:

(1) applying a magnetic layer on one surface of a substrate,

(2) thereafter applying an anti-static layer, containing filler dispersed in a radiation-sensitive curable resin binder, to the opposite surface of said substrate,

(3) irradiating said radiation-sensitive curable resin binder with active energy radiation to cure said resin binder, and

(4) rolling said tape.

4,419,407

ELASTOMERIC COATING COMPOSITIONS

Robert M. Piccirilli, Pittsburgh; Wen-Hsuan Chang, Gibsonia; Samuel Porter, Jr., Natrona Heights; James B. O'Dwyer, Gibsonia, all of Pa., and Kyu-Wang Lee, Danville, Calif., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 29, 1982, Ser. No. 343,785

Int. Cl.³ B32B *27/40*

U.S. Cl. 428—423.1 **16 Claims**

1. A thermosetting, elastomeric coating composition sprayable at resin solids content of at least 40 percent by weight and being flexible such that when the coating composition is deposited on an elastomeric substrate and cured, the coated substrate can be bent around a ½-inch mandrel with the coating facing outwardly and the coating exhibits no breaks or cracks when tested at 70–75° F., comprising as the film-forming constituents:

(A) a hard polyester polyol having at least 20 percent by weight cyclic moieties and the percentage of cyclic moieties being not greater than that required to achieve said flexibility, having a hydroxyl value of at least 80 and the hydroxyl value being not greater than that required to achieve said flexibility, a molecular weight of 300 or greater but not greater than that required for formulating said coating composition with a sprayability of at least 40 percent by weight, and said polyester polyol having a Sward Hardness value of at least 15,

(B) a polyurethane polyol having a molecular weight of 2,000 or greater but not greater than that required for formulating said coating composition with a sprayability of at least 40 percent by weight, and said polyurethane polyol having a Sward Hardness value of less than 10, and

(C) a curing agent capable of reacting with the active hydrogens in (A) and (B) to form a crosslinked coating selected from the class consisting of aminoplast and polyisocyanates; the difference in Sward Hardness values between

(A) and (B) being greater than 10; the ratio of (A)+(B):(C) being within the range of 5 to 0.5:1; the weight ratio of (A)+(C):(B) being within the range of 100 to 1:1.

4,419,408

COMPOSITE STRUCTURES

Seymour Schmukler, Palatine; John Machonis, Jr., Schaumburg, and Mitsuzo Shida, Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 327,278, Dec. 4, 1981. This application Dec. 23, 1982, Ser. No. 452,873

Int. Cl.³ B32B *27/32, 27/28*

U.S. Cl. 428—424.4 **47 Claims**

1. A composite structure of components comprising:

(a) a substrate, and adhered thereto

(b) an adhesive blend consisting essentially of:

(i) about 0.1–40 parts by weight in said blend of a graft copolymer of about 70–99.999 wt. % of a polyethylene backbone grafted with about 30–0.001 wt. % of at least one grafting monomer comprising at least one polymerizable ethylenically unsaturated carboxylic acid or carboxylic acid anhydride for a total of 100% and

(ii) about 99.9–60 parts by weight of a blending resin mixture of about 25–90 wt. % of a high density polyethylene and about 75–10 wt. % of a polypropylene for a total of 100%.

4,419,409

BICOLORED POLYHEDRAL BODY OF ALUMINUM

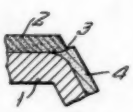
Machiro Kushida, Sayama; Tsuneji Takasugi, Hanno, and Kenji Irie, Yokohamashi, all of Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan

Division of Ser. No. 234,176, Feb. 13, 1981, Pat. No. 4,375,391. This application Sep. 16, 1982, Ser. No. 418,995

Claims priority, application Japan, Feb. 27, 1980, 55-23522

Int. Cl.³ B32B *1/10, 15/20*

U.S. Cl. 428—469 **2 Claims**



1. A bicolored polyhedral body made of aluminum having at least a first face and a second face with an anodically oxidized layer on the surface of the aluminum body, said first and second faces being demarcated by a ridgeline and colored in different colors wherein the peripheral margin of the anodically oxidized layer on the second face extends and intrudes interstitially between the anodically oxidized layer on the first face and the surface of the aluminum body.

4,419,410

HIGHLY STEREOREGULAR FILMS OF IMPROVED SURFACE CHARACTERISTICS AND METHOD OF FORMING SAME

Milton L. Weiner, Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,830

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—516 **25 Claims**

10. An oriented multi-layer polypropylene film structure having a surface-modifying agent selected from the group consisting of a slip agent, antistatic agent, antifog agent, antiblock agent, and any mixtures thereof bloomed on the surface thereof comprising a coextruded combination of:

(a) a base layer comprising polypropylene of comparatively high stereoregularity, the precursor resin of which contains said surface-modifying agent at least substantially uniformly dispersed therein; and

(b) a skin layer comprising polypropylene of comparatively low stereoregularity on at least one surface of (a);

said combination having been oriented;

the surface of (b) having bloomed thereon said surface-modifying agent in an effective quantity greater than that of said surface-modifying agent-containing precursor resin alone in extruded film form.

4,419,411

MULTI-LAYER POLYPROPYLENE FILM STRUCTURE AND METHOD OF FORMING SAME

Hee Chung P. Park, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,483

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—516 **13 Claims**

1. An oriented multi-layer polypropylene film structure having surface-modifying agents comprising finely divided silica, silicone oil and an amide of a water-insoluble monocarboxylic acid having from about 8 to about 24 carbon atoms on a surface thereof, said structure comprising coextruded layers of:

(a) a base layer comprising polypropylene of comparatively high stereoregularity, the precursor resin of which contains an amide of a water-insoluble monocarboxylic acid having from about 8 to about 24 carbon atoms, and mixtures of said amides; and

(b) a skin layer comprising a polyolefin of comparatively low stereoregularity on at least one surface of (a), said skin layer containing a combination of finely divided silica and a silicone oil; the surface of (b) having bloomed thereon at least some of the amide of (a).

4,419,412

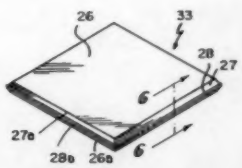
PLASTIC BLANK STRUCTURE

Robert M. Gross, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 216,747, Dec. 16, 1980. This application May 3, 1982, Ser. No. 373,925

Int. Cl.³ B32B *9/04*

U.S. Cl. 428—542.8 **6 Claims**



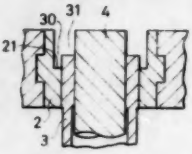
1. A plastic polygonal blank capable of being made into a container by high-melt, high-pressure methods comprising a first and a second surface, said surfaces being substantially parallel to one another, at least one transitional surface extending outwardly between said first and second surfaces at an angle between about 20° to about 85° and presenting a smooth surface commensurate to that of said first and second surface, and an peripheral vertical wall providing an outer surface for said blank, said peripheral vertical wall connecting said at least one transitional surface and being roughened as compared to the other surfaces of said blank.

4,419,413

POWDER MOLDING METHOD AND POWDER COMPRESSION MOLDED COMPOSITE ARTICLE HAVING A REST-CURVE LIKE BOUNDARY

Tadashi Ebihara, Hatogaya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,563
Claims priority, application Japan, Feb. 26, 1981, 56-26116
Int. Cl.³ B22F 7/02, 3/16; B32B 7/02, 31/20
U.S. Cl. 428—548 38 Claims



1. A powder compression molding method for producing a multi-layer powder compression molded article having a plurality of different material layers disposed in a compression direction by utilizing relative movements of an upper punch, a lower punch, a die, and first and second feed shoes, the method comprising the steps of:

forming a first space between the die and the lower punch, the die having a step formed therein;

introducing a first powder into the first space;

lowering the lower punch relative to the die to form a second space above a top surface of the first powder;

introducing a second powder into the second space; and

compressing the first and second powders to form the multi-layer powder compression molded article.

33. A powder compression molded article comprising a first and a second layer, the first and second layers comprising different materials, a boundary between the different material layers having a rest-curve like shape formed by relative movement between a punch and a die after said first layer in powder form is deposited on an upper surface of said punch and said die but prior to said second layer in powder form being deposited on said first powder layer.

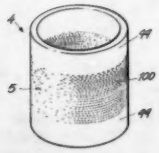
34. The article claimed in claim 33, wherein said powder compression molded article comprises a metallurgical article.

4,419,414

CYLINDER FOR USE WITH OTHER COMPONENTS IN PROCESSING MATERIAL

Robert R. Fischer, Michigan City, and Joe R. Urschel, Valparaiso, both of Ind., assignors to Urschel Laboratories, Incorporated, Valparaiso, Ind.

Filed Jul. 24, 1981, Ser. No. 286,373
Int. Cl.³ B02C 19/00
U.S. Cl. 428—575 15 Claims



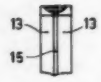
3. A tubular cylinder for receiving a food product to be extruded, said cylinder having a solid cylindrical metal wall of substantially uniform thickness extending throughout at least a major portion of its length provided with a multitude of substantially radial undrilled outwardly diverging passages extending therethrough through which the product received in said cylinder can be extruded outwardly through said passages and said cylinder being constructed for receiving means for forcing the product outwardly through said passages.

4,419,415

MAGNETIC HEAD COMPRISING TWO SPOT WELDED METAL PLATES

Adrianus C. H. J. Liefkens, and Gerardus J. A. M. Notenboom, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 18, 1982, Ser. No. 339,931
Claims priority, application Netherlands, May 2, 1981, 8100545
Int. Cl.³ G11B 5/16
U.S. Cl. 428—594 12 Claims



1. A magnetic head, comprising:

at least one core part having magnetic properties and including two stacked parallel plates each having a minor face, the plates being formed of a material consisting essentially of Al-Fe-Si,

readily adhering ductile metal layers each having an essentially equal thickness in a range between 5 and 500 μm provided on respective minor faces of the plates, the layers being arranged substantially adjacent one another so that the plates are mutually securable by welding the layers, and

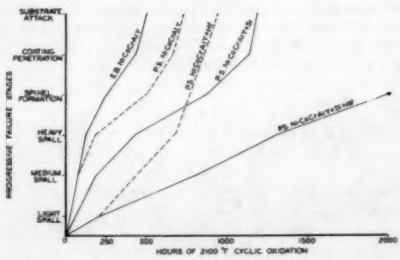
a weld located in the layers, the weld extending a maximum depth into the layers in a direction generally toward the minor faces, the maximum depth being less than the thickness of each layer so that the weld mutually secures the plates without affecting their magnetic properties.

4,419,416

OVERLAY COATINGS FOR SUPERALLOYS

Dinesh K. Gupta, Vernon, and David S. Duvall, Cobalt, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 5, 1981, Ser. No. 289,952
Int. Cl.³ B32B 15/00
U.S. Cl. 428—656 6 Claims



1. A gas turbine engine component which comprises a substrate selected from the group consisting of Ni and Co base superalloys having thereon a protective coating consisting essentially of 5–40% Cr, 8–35% Al, 0.1–2.0% Y, 1–7.0% Si and 0.1–2.0% Hf balance selected from the group consisting of Ni, Co and mixtures thereof.

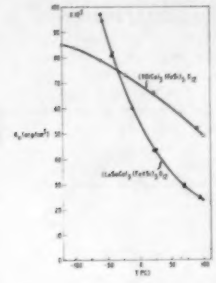
4,419,417
MAGNETIC DOMAIN DEVICE HAVING A WIDE OPERATIONAL TEMPERATURE RANGE

Roy C. Le Craw, Westfield; Lars C. Luther, Basking Ridge, and Terence J. Nelson, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 9, 1981, Ser. No. 319,609

Int. Cl.³ G11C *11/14*

U.S. Cl. 428—692 **7 Claims**



1. Device comprising a supported layer of a magnetic garnet material having uniaxial magnetic anisotropy in a direction which is essentially perpendicular to said layer,

said layer being capable of sustaining a magnetic domain whose magnetization is essentially antiparallel to the magnetization of a portion of said layer surrounding said domain, said domain having a diameter which is less than 3 micrometers, and said domain having mobility which is greater than 2000 centimeters per second per oersted,

said device being characterized in that the composition of said garnet material is essentially as denoted by the formula $(Y_{3-p-q-r-s}Bi_pCa_qRM_rRN_s)(Fe_{5-t-u-v-w}AlHd\ tGa_uSi_v.Ge_w)O_{12}$ where RM denotes one or both of the magnetic rare earth elements Eu and Sm, where RN denotes one or several of the small-ionic-radius rare earth elements Lu, Tm, and Yb, where p is in the range of 0.2–1.5, q is in the range of 0.2–0.9, r is in the range of 0.0–0.3, s is in the range of 0.0–0.6, t is in the range of 0.0–1.0, u is in the range of 0.0–1.0, v is in the range of 0.2–0.9, w is in the range of 0.0–0.9, and where v + w is essentially equal to q whereby said device has an operational temperature range which comprises the range of −150 to 150 degrees C.

4,419,418
INDIVIDUAL RECHARGEABLE ELECTRIC CELL

Reinhard Knodler; Friedrich Harbach, and Ludwig Weiler, all of Heidelberg, Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

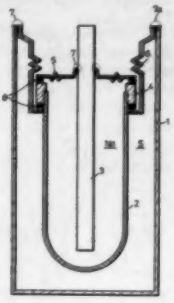
Filed Mar. 26, 1982, Ser. No. 362,550

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114348

Int. Cl.³ H01M *4/36, 2/38, 2/02, 2/08*

U.S. Cl. 429—104 **1 Claim**

1. Individual rechargeable electric cell with liquid sodium as the negative electrochemical material and liquid sulfur absorbed in graphite as the positive electrochemical material which comprises a metallic tubular housing, a tubular container of a sodium ion-conducting solid electrolyte open at one end disposed in the housing with space between the inner housing surface and the outer container surface for one said electrochemical material and the container interior for the other said electrochemical material, a current collector extending into said container interior, a first flexible flange connecting the current collector to the container, a second flexible flange connecting the housing to the container, an alpha-Al_2O_3 ring fused-on to the open end of the electrolyte, said ring connected to said two flanges via thermocompression seals, the first flange connected to the current collector by a weld, the second flange connected to the housing by a weld, said first flange containing bellows or flexible sleeves to allow



lateral movement of the solid electrolyte relative to the current collector, and said second flange containing bellows or flexible sleeves to allow vertical movement of the electrolyte relative to the housing.

4,419,419
RECHARGEABLE ELECTRIC STORAGE BATTERY

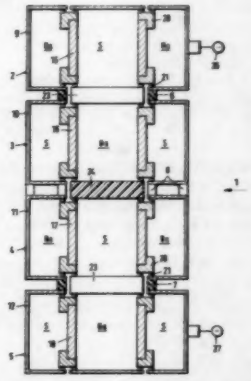
Reinhold Knödler, Heidelberg, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,120

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118194

Int. Cl.³ H01M *4/36, 2/02, 4/48, 6/18*

U.S. Cl. 429—104 **6 Claims**



1. Rechargeable electric storage battery comprising

(a) a plurality of individual cells, each cell having liquid sodium as the negative and liquid sulfur, absorbed in graphite, as the positive electrochemical material, as well as a sodium ion-conducting solid electrolyte and a metallic housing,

(b) the individual cells being series-connected and the individual cells being connected to each other, each cell having a tubular electrolyte arranged coaxially in a tubular housing, to which the electrolyte at both its ends is connected;

(c) two adjacent series-connected individual cells having a dissimilar arrangement of the sodium and the sulfur mate-

rials with one of said two cells having the sulfur between the housing and the electrolyte and the sodium in the interior of the electrolyte, and the other of said two cells having the sulfur and sodium materials in the reverse order;

(d) the electrolytes of some of the two adjacent series-connected individual cells being separated from each other by an electrically conducting plate while the housing of said two cells are connected by an alpha-Al_2O_3 ring, and the electrolytes of other two adjacent series-connected individual cells being separated from each other by an electrically non-conducting plate while the housing of said two cells are connected by an Al ring, and these two forms of connections alternating in the series-connection of the cells.

4,419,420

BATTERY CONTAINER AND LID

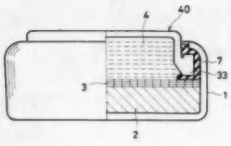
Morio Ishizaki, Kobe, Japan, assignor to Ishizaki Press Kogyo Co., Ltd., Itami, Japan

Filed Apr. 6, 1981, Ser. No. 251,539

Claims priority, application Japan, Mar. 8, 1980, 55-29529

Int. Cl.³ H01M *2/08*

U.S. Cl. 429—185 **2 Claims**



1. A battery container comprising a battery container main body and a lid, said lid having a peripheral portion U letter shaped in section to form an inner and outer peripheral side for engagement with said main body through a packing when an opening edge of said main body is curled inward, wherein

the lower end of said peripheral portion U letter shaped in section is formed with a plastic deformed outer surface which is formed by the press of die means,

said plastic deformed outer surface comprises a horizontal surface facing downward, and an oblique surface extending from the inner peripheral edge of said horizontal surface and facing downward and inward, and a vertical surface extending from the outer peripheral edge of said horizontal surface and facing outward,

said oblique surface is formed with material of the lid biased toward the outer peripheral side at the inner peripheral portion of the lower end of said peripheral portion U letter shaped in section, and

the material biased from the inner peripheral side to the outer peripheral side of said peripheral portion U letter shaped in section being at the corner defined by said horizontal surface and said vertical surface,

whereby the thickness of the outer peripheral side of said peripheral portion U letter shaped in section is larger than that of the inner peripheral side of said peripheral portion U letter shaped in section, and work hardening is caused due to said biasing of the material at said outer peripheral side including said corner.

4,419,421

ION CONDUCTOR MATERIAL

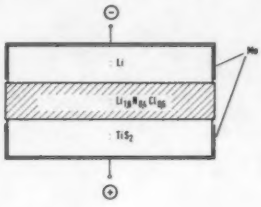
Winfried Wichelhaus, Ingelheim am Rhein; Werner Weppner, Stuttgart, and Peter Hartwig, Weinheim, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften E.V., Gottingen, Fed. Rep. of Germany

Continuation of Ser. No. 110,584, Jan. 9, 1980. This application Oct. 22, 1981, Ser. No. 313,870

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1979, 2901303

Int. Cl.³ H01M *6/18*

U.S. Cl. 429—191 **5 Claims**



1. Solid ion conductor consisting of a compound selected from

$Li_{1.8}N_{0.4}Cl_{0.6}$

$Li_{1.6}N_{0.3}Cl_{0.7}$

Li_6NBr_3.

4,419,422

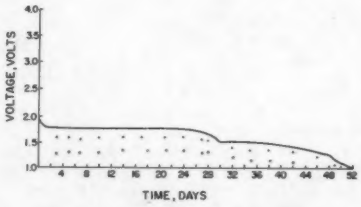
SULFIDE-CONTAINING CATHODE FOR NONAQUEOUS CELLS

Violeta Z. Leger, North Olmsted, and William P. Evans, Rocky River, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 22, 1982, Ser. No. 360,850

Int. Cl.³ H01M *6/14, 4/58, 4/34, 4/36*

U.S. Cl. 429—194 **6 Claims**



1. A nonaqueous cell comprising an active anode, an organic electrolyte solution and a solid cathode material comprising a sulfide-containing cathode having the formula:

$$M_aM'_bS_c$$

where

M is one or more mono- or divalent metals selected from the group consisting of Co, Ni, Fe, Sn, Pb, Mn, Zn, Cd, Hg, Cu and Ag;

M' is at least one material selected from the group consisting of trivalent arsenic (As), antimony (Sb), and bismuth (Bi) with the proviso that when MM' is a binary metal combination then when M' is Sb, M cannot be Pb or Sn and when M' is Bi, M cannot be Fe, Sn or Pb;

S is sulfur (as sulfide); and

a, b and c are each integers with each being equal to or greater than 1 with the proviso that when M is monovalent, $c=(a+3b)/2$ and when M is divalent, $c=(2a+3b)/2$.

4,419,423

NONAQUEOUS CELLS EMPLOYING HEAT-TREATED MNO_2CATHODES AND A PC-DME-$LICF_3SO_3$ ELECTROLYTE

Violeta Z. Leger, North Olmsted, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 163,497, Jun. 27, 1980, abandoned. This application Jun. 2, 1982, Ser. No. 384,222

Int. Cl.³ H01M 6/14

U.S. Cl. 429—197 9 Claims

1. A nonaqueous cell comprising a metal anode selected from the group consisting of lithium, potassium, sodium, calcium, magnesium, aluminum and alloys thereof, a cathode of heat-treated manganese dioxide a conductive agent and a binder, wherein the heat-treated manganese dioxide has a water content of less than 1 weight percent based on the weight of the manganese dioxide and a liquid organic electrolyte comprising lithium trifluoromethane sulfonate dissolved in propylene carbonate and a dimethoxyethane.

4,419,424

ELECTRODES FOR ELECTROCHEMICAL CELLS CURRENT GENERATING CELLS AND RECHARGEABLE ACCUMULATORS

John D. Julian, Flötzersteig 203, Vienna A-1140, Austria

Filed Jul. 14, 1981, Ser. No. 286,571

Int. Cl.³ H01M 4/62

U.S. Cl. 429—217 10 Claims

1. An electrode for electrochemical cells, current generating cells and rechargeable accumulators, comprising a current collector and a sintered mixture of a metallic powder and ethylene or polyethylene vinylacetate containing an essentially insoluble ferri- or ferrocyanide compound as active electrode material, the mixture being porous and permeable to electrolyte.

4,419,425

METHOD FOR MANUFACTURING COLOR FILTER

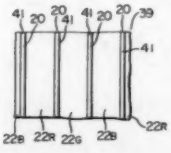
Kazufumi Ogawa, Hirakata, and Isamu Kitahiro, Yawata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

Filed May 20, 1982, Ser. No. 380,344

Claims priority, application Japan, May 20, 1981, 56-77199

Int. Cl.³ G03C 5/00

U.S. Cl. 430—7 4 Claims



1. A method for manufacturing a color filter comprising:

(a) forming a stripe -or lattice- shaped light-shield film on one major surface of a transparent glass substrate;

(b) forming a photosensitive resin film to be dyed on said one major surface of said glass substrate on which said light-shield film is formed;

(c) exposing said resin film by radiating light from the other major surface of said glass substrate, using said light-shield film as a mask, and developing said resin film, thereby removing a nonexposed portion of said resin film on said light shield film; and

(d) forming a photoresist film over said light-shield film and said resin film;

(e) exposing said photoresist film through a mask having a predetermined pattern thereon;

(f) developing said exposed photoresist film to selectively form an opening therein which corresponds to a portion of said resin film be dyed, a residual portion of said photoresist film being provided as an antidye mask;

(g) dying the portion of the resin film which is uncovered in the opening of the photoresist film; and

(h) removing said photoresist film.

4,419,426

METHOD FOR THE VISUAL INSPECTION OF THE REPRODUCTION QUALITY OF DRAWING ELEMENTS AND ELEMENTS FOR THE EXECUTION OF THE METHOD

Christof Kehl, St. Gallen, Switzerland, assignor to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

PCT No. PCT/DE80/00103, § 371 Date Mar. 5, 1982, § 102(e) Date Mar. 5, 1982, PCT Pub. No. WO82/00368, PCT Pub. Date Feb. 4, 1982

PCT Filed Jul. 15, 1980, Ser. No. 355,736

Int. Cl.³ G03C 5/04

U.S. Cl. 430—30 6 Claims

1. A method for the visual inspection of the reproduction quality of drawing elements which are exposed by means of a cathode ray tube on light-sensitive photo material, characterized in that at least three different surface elements which are normal elements, positive elements and negative elements are exposed and such elements differ in their reaction to different processing conditions such that when under-exposed, the negative elements become weaker and when over-exposed the positive elements become stronger and with normal exposure all three elements appear the same, characterized in that said three surface elements are combined with one another such that a control field occurs which has figurative or verbal forms of expression with different processing conditions, characterized in that raster points which have the shape and form of a traditional raster point are employed as said normal elements, characterized in that raster elements which include latent intensification forms are employed as said positive elements, characterized in that raster elements which include latent weak points are employed as said negative elements, and wherein said normal element consists of a contiguous black surface.

4,419,427

ELECTROPHOTOGRAPHIC MEDIUM WITH PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID N,N'-BIS-(2',6'-DICHLOROPHENYL)-DIIMIDE

Fritz Graser, Ludwigshafen; Gerhard Hoffmann, Otterstadt; Reinhold J. Leyrer, Ludwigshafen, and Peter Neumann, Wiesloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,600

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110955

Int. Cl.³ G03G *5/06, 5/14*

U.S. Cl. 430—58 **2 Claims**

1. An electrophotographic recording medium which consists essentially of an electrically conductive base, a first layer containing charge carrier-producing dyes, and a second layer which is substantially transparent to actinic light and is composed of an insulating organic material containing at least one compound which is charge carrier-transporting when exposed to light, wherein perylene-3,4,9,10-tetracarboxylic acid N,N'-bis-(2',6'-dichlorophenyl)-diimide is employed as the charge carrier-producing dye.

4,419,428

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MEDIA HAVING A DIS-AZO COMPOUND

Kazuharu Katagiri; Shozo Ishikawa; Katsunori Watanabe; Shigeto Ohta, and Makoto Kitahara, all of Tokyo, Japan, assignors to Canon Inc., Tokyo, Japan

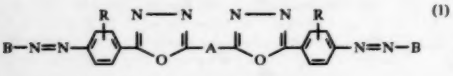
Filed May 18, 1981, Ser. No. 264,799

Claims priority, application Japan, Jun. 2, 1980, 55-72752

Int. Cl.³ G03G *5/06, 5/14*

U.S. Cl. 430—77 **14 Claims**

1. An electrophotographic light-sensitive medium having a light-sensitive layer, comprising: fine particles of a dis-azo compound represented by Formula (1)



(1)

wherein A represents one of a single bond,

or $-CH=CH-$;

B represents an aromatic coupler having therein a phenolic hydroxy group; and R is selected from the group consisting essentially of hydrogen, a halogen and a lower alkyl having 1 to 4 carbon atoms.

4,419,429

SENSITIZED ELECTROPHOTOGRAPHIC PHOTOSENSITIVE COMPOSITION

Toru Nakazawa, Sennan, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 8, 1982, Ser. No. 346,774

Claims priority, application Japan, Feb. 9, 1981, 56-16823

Int. Cl.³ G03G *5/06, 5/09*

U.S. Cl. 430—83 **3 Claims**

1. A photosensitive composition for electrophotography which consists essentially of (A) a phthalocyanine photoconductor, (B) 4-nitrophthalic anhydride as a sensitizer, and (C) an electrically insulating, electrophotographically inactive resin binder having a volume resistivity of at least 1×10^{14} Ω-cm, the sensitizer (B) being present in an amount of 1 to 200 parts by weight per 100 parts by weight of the photoconductor (A), and the photoconductor (A) and the binder (C) being present at a weight ratio of from 1/20 to 1/1.

4,419,430

DRY TRANSFER OF ELECTROPHOTOGRAPHIC IMAGES

Sidney Cooper, Roslyn Harbor, and Ezekiel J. Jacob, Brooklyn, both of N.Y., assignors to Ani-live Film Service, Inc., New York, N.Y.

Division of Ser. No. 799,476, May 23, 1977, Pat. No. 4,216,283. This application May 21, 1980, Ser. No. 152,031

Int. Cl.³ G03G *9/08*

U.S. Cl. 430—109 **3 Claims**

1. An electrophotographic adhesive toner composition comprising an intumescent electroscopic powder mixture, comprising a thermoadhesive agent, a pigment and a dry intumescing agent, said thermoadhesive agent comprising microspheres carrying or containing adhesive characterized by comprising an encapsulating shell and an inner core, said core comprising a tacky balsamic solid or a tacky liquid and said encapsulating shell comprising a thermoplastic, thermoadhesive material, said toner composition ued in an electrophotographic process, which process comprises formation of an electrostatic image by electrophotographic means upon a carrier sheet, corresponding to information to be recorded, formation of a pattern of said toner composition on said carrier sheet corresponding to said electrostatic image, thereby forming a toner-image, said carrier sheet being abhesive towards said toner-image.

4,419,431

ONE- OR TWO-COMPONENT DIAZO-TYPE MATERIAL WITH DIPHENYL DIAMINE AS LIGHT FADE INHIBITOR

Regina Lischewski, Wolfen; Jörg Marx, Dessau; Reinhard Walter, Wolfen, and Peter Möckel, Lützschena, all of German Democratic Rep., assignors to VEB Filmfabrik Wolfen, Wolfen, German Democratic Rep.

Filed Nov. 30, 1981, Ser. No. 326,099

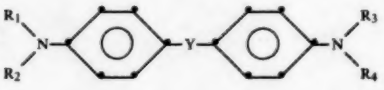
Int. Cl.³ G03C *1/60*

U.S. Cl. 430—179 **15 Claims**

1. A one- or two-component diazo-type composition with a fading inhibitor, comprising a light-sensitive diazonium compound, and a compound of the general formula

(I)

or



(II)

having a light absorption maximum less than about 380 nm, wherein

R_1, R_2, R_3, R_4 being the same or different, represent hydrogen, alkyl with 1 to 5 carbon atoms, R_1 and R_2 and/or R_3 and R_4 represent the alkyl groups necessary for completion of a 5- or 6-membered heterocyclic ring, with or without another hetero atom of N, O or S;

R_5, R_6 being the same or different, represent hydrogen, aryl, alkyl with 1 to 4 carbon atoms;

Y represents —S—, —SO—, $-SO_2-$; and

n is 0, 1, 2, 3;

as the inhibitor in an amount sufficient to increase light stability of azo image dyestuff formed by light imaging and development of said composition.

4,419,432

DIAZOTYPE COMPOSITION STABILIZATION

Noreen J. Pillitteri, Spring Valley, N.Y., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Sep. 22, 1982, Ser. No. 421,688
Int. Cl.³ G03C 1/60
U.S. Cl. 430—179 5 Claims

1. Diazotype material comprising a light-sensitive diazonium compound, an azo coupler compound, and a stabilizing amount of a compound selected from the group consisting of caprolactam, caprylolactam, and azacylooctanone.

4,419,433

PHOTOGRAPHIC MATERIAL

Massashi Kubbota, and Touru Noda, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,298
Claims priority, application Japan, Dec. 3, 1981, 56-195038
Int. Cl.³ G03C 1/06; D21D 3/00
U.S. Cl. 430—206 24 Claims

1. A photographic material containing at least one kind of silver halogenide developer in at least one stratum of photograph-constructing layer provided on a support prepared by coating a base paper material with a film-formable resin, wherein said base paper material for support is a paper treated with at least one member selected from the group consisting of aminomethanesulfonic acid and its salts.

19. A photographic material according to claim 1, wherein at least one stratum of said photograph-constructing layer is silver halogenide photographic emulsion layer.

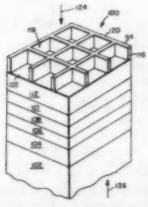
22. A photographic material according to claim 1, wherein said photographic material is a photographic material for diffusion transfer process and the photograph-constructing layer of its silver halogenide photographic material and the photograph-constructing layer of its image-receiving material both contain a silver halogenide developer.

4,419,434

IMAGE TRANSFER FILM UNIT WITH MODIFIED SURFACE LAYER CONTAINING CAPILLARIES

Michel F. Molaire, Rochester, and John V. Williams, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,320
Int. Cl.³ G03C 1/76, 1/48, 1/40, 5/54
U.S. Cl. 430—207 10 Claims



1. In an image transfer film unit comprised of
a support and, located on said support,
an imaging portion comprised of radiation-sensitive imaging means capable of providing mobile image forming material as a function of exposure and means for receiving said mobile image forming material from said imaging means to form a viewable transferred image,
the improvement comprising a capillary surface layer overlying said imaging portion and forming an array of open-ended capillaries for supplying processing liquid uniformly to said imaging portion, the capillaries subtending within the image viewing area of said image transfer film unit more than half the area of said capillary surface layer.

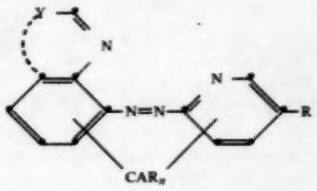
4,419,435

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING 6-HETEROCYCLYLAZO-3-PYRIDINOL NONDIFFUSIBLE CYAN DYE-RELEASING COMPOUNDS AND PRECURSORS THEREOF

James A. Reczek, Rochester, and James K. Elwood, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 380,844, May 21, 1982, abandoned. This application Jan. 17, 1983, Ser. No. 458,501
Int. Cl.³ G03C 1/40, 5/54, 1/10, 7/00
U.S. Cl. 430—223 44 Claims

24. In a photographic assemblage comprising:
(i) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material; and
(ii) a dye image-receiving layer; the improvement wherein said dye image-providing material is a nondiffusible compound capable of releasing at least one diffusible cyan dye moiety comprising a 6-heterocyclylazo-3-pyridinol, said compound having the formula:



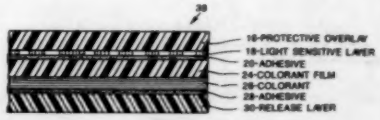
wherein:
(a) Y represents the atoms necessary to complete a 5- or 6-membered aromatic heterocyclic fused ring;
(b) CAR represents a ballasted carrier moiety capable of releasing said diffusible cyan dye moiety as a function of development of said silver halide emulsion layer under alkaline conditions;
(c) R represents a hydroxy group, a salt thereof, or a hydrolyzable precursor thereof, or CAR which is linked to said dye moiety through an oxygen atom thereon; and
(d) is 0, 1 or 2, with the proviso that when n is 0, then R is CAR which is linked to said dye moiety through an oxygen atom thereon.

4,419,436

PHOTOSENSITIVE PLATE

Leonard S. Kranser, 1718 Elevado Ave., Arcadia, Calif. 91106

Filed Jan. 22, 1982, Ser. No. 341,871
Int. Cl.³ G03C 5/04, 5/54
U.S. Cl. 430—260 29 Claims



1. A kit for preparing a mountable image plate comprising:
(a) a light sensitive film comprising:
(i) a light transmitting polymeric base,
(ii) an optically clear, polymeric protective overlay, and
(iii) a light sensitive layer between the base and the overlay; and

(b) a mounting element for the light sensitive film after the film has been developed and the polymeric base has been removed, the mounting element comprising:

(i) an optically transmissive top protective liner,

(ii) a clear first adhesive layer on the underside of the top protective layer,

(iii) a color layer comprising a clear colorant film on the underside of the first adhesive layer and colorant on the underside of the colorant film,

(iv) a pressure-sensitive second adhesive layer on the underside of the colored layer; and

(v) a moisture resistant release layer on the underside of the pressure-sensitive adhesive layer,

wherein the top protective layer can be removed from the first adhesive layer and the release layer can be removed from the second adhesive layer.

4,419,437

IMAGE-FORMING COMPOSITIONS AND ELEMENTS CONTAINING IONIC POLYESTER DISPERSING AGENTS

John M. Noonan; Raymond W. Ryan, and James F. Houle, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

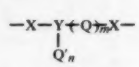
Filed Feb. 11, 1981, Ser. No. 233,526
Int. Cl.³ G03C 1/68
U.S. Cl. 430—270 **14 Claims**

1. An image-forming composition comprising:

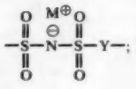
a radiation sensitive polymeric composition,

a particulate pigment, and

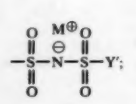
a substantially amorphous polyester comprising (1) dicarboxylic acid recurring units of which from about 2 to about 25 mole percent, based on total moles of said dicarboxylic acid recurring units, are ionic dicarboxylic acid recurring units of the formula



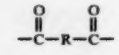
wherein each of m and n is 0 or 1 and the sum of m and n is 1; each X is carbonyl; Q has the formula:



Q′ has the formula:



Y is a divalent aromatic radical; Y′ is a monovalent aromatic radical or alkyl; and M is a monovalent cation; and the remainder of said dicarboxylic acid recurring units are nonionic and have the formula



wherein R is alkylene, cycloalkylene or arylene; and (2) diol recurring units derived from diols of the formula HO—R^1—OH wherein R^1 is a divalent aliphatic, alicyclic or aromatic radical having from 2 to 12 carbon atoms and containing an ether linkage,

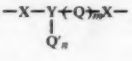
said polyester being present in said image-forming composition in an amount effective to uniformly disperse said pigment in said image-forming composition.

13. In a process for preparing an image-forming composition comprising a radiation sensitive polymeric composition, an organic solvent, a particulate pigment and a dispersing agent, said process comprising

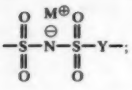
(1) dispersing said pigment in said solvent by means of said dispersing agent to form a pigment dispersion, and

(2) combining said radiation sensitive polymeric composition with said pigment dispersion,

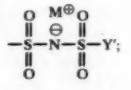
the improvement wherein said dispersing agent is a substantially amorphous polyester and is added to said image-forming composition in an amount effective to uniformly disperse said pigment in said image-forming composition; said polyester comprising (1) dicarboxylic acid recurring units of which from about 2 to about 25 mole percent, based on total moles of said dicarboxylic acid recurring units, are ionic dicarboxylic acid recurring units of the formula:



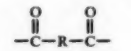
wherein each of m and n is 0 or 1 and the sum of m and n is 1; each X is carbonyl; Q has the formula:



Q′ has the formula:



Y is a divalent aromatic radical; Y′ is a monovalent aromatic radical or alkyl; and M is a monovalent cation; and the remainder of said dicarboxylic acid recurring units are nonionic and have the formula



wherein R is alkylene, cycloalkylene or arylene; and (2) diol recurring units derived from diols of the formula HO—R^1—OH wherein R^1 is a divalent aliphatic, alicyclic or aromatic radical having from 2 to 12 carbon atoms and containing an ether linkage.

4,419,438

IMAGE FORMING MATERIAL AND METHOD

Kuniomi Etoh, Shiga; Toshikiyo Tanaka, Toyonaka; Yoshio Katoh, Otsu; Takeo Sugiura, Tokorozawa; Yoshiyasu Itoh, Yono, and Takeo Kohira, Chiba, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Mar. 9, 1982, Ser. No. 356,410
Claims priority, application Japan, Mar. 10, 1981, 56-35008
Int. Cl.³ G03F 7/02; G03C 1/76, 5/00
U.S. Cl. 430—275 **12 Claims**

1. An image reproducing material comprising a supporting sheet bearing a metal or metallic compound layer having a thickness of 100 to 1000 Å and a photosensitive resin layer, which is characterized in that said photosensitive resin layer contains (1) ethylenically unsaturated compound which is polymerizable by the action of free radical and chain propaga-

tive, (2) a compound showing photochromism by radical mechanism, (3) free radical producing agent and (4) actinic light absorber.

4,419,439

PROCESS FOR FORMING PHOTOGRAPHIC IMAGES

Shigeru Kuwazima; Eiichi Kato, and Minoru Yamada, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

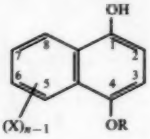
Filed Nov. 16, 1981, Ser. No. 322,053

Claims priority, application Japan, Nov. 14, 1980, 55-160325

Int. Cl.³ G03C *7/00*

U.S. Cl. 430—375 **24 Claims**

1. A process for forming a photographic image comprising imagewise exposing a silver halide photographic light-sensitive material to light and development processing the exposed silver halide photographic light-sensitive material with an alkaline processing solution having a pH of 10 to 13 and in the presence of an auxiliary developing agent, wherein the silver halide photographic light-sensitive material contains, as a developing agent, an alkoxynaphthol compound, which is represented by formula (I)



(I)

wherein R represents an alkyl group having from 6 to 22 carbon atoms, a substituted alkyl group having from 6 to 22 carbon atoms, an aryl group having from 6 to 22 carbon atoms, a substituted aryl group having from 6 to 22 carbon atoms, an alkenyl group having from 6 to 22 carbon atoms, a substituted alkenyl group having from 6 to 22 carbon atoms or an aralkyl group having from 7 to 22 carbon atoms; X represents an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having from 1 to 6 carbon atoms, or a halogen atom; and n represents an integer from 1 to 3, said alkoxynaphthol compound being oxidized by the silver in said exposed silver halide photographic light sensitive material during development processing with the resulting oxidized alkoxynaphthol compound reacting together to form a dye.

4,419,440

PROCESS FOR THE INTRODUCTION OF HYDROPHOBIC PHOTOGRAPHIC ADDITIVES

Lothar Kuhnert, Berlin; Burkhard Costisella, Neuenhagen; Christoph Roth, Halle-Neustadt; Walter Kroha, Wolfen; Wolfgang Baumbach, and Renate Hoppe, both of Berlin, all of German Democratic Rep., assignors to VEB Filmfabrik Wolfen, Woflen, German Democratic Rep.

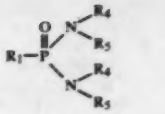
Filed Nov. 9, 1981, Ser. No. 319,857

Claims priority, application German Democratic Rep., Nov. 26, 1980, 225482

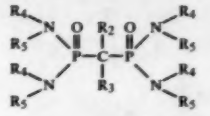
Int. Cl.³ G03C *1/40*

U.S. Cl. 430—377 **17 Claims**

1. Process for the introduction of an hydrophobic photographic additive into a hydrophilic colloidal layer, wherein these additives are dissolved in an organic solvent that is not completely miscible with water and are subsequently dispersed in an aqueous medium, characterized in that at least one phosphonic acid diamide or methane bisphosphonic acid diamide of the general formulae

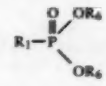


I

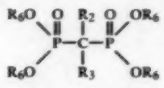


II

and/or phosphonic acid esters or methane bisphosphonic acid esters of the general formulae

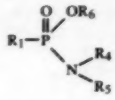


III

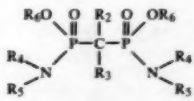


IV

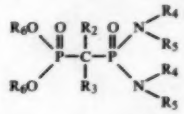
and/or mixed phosphonic acid esters amides or methane bisphosphonic acid esters of the general formulae



V



VI



VII

wherein R_1 represents aryl, methyl-substituted aryl, halogen-substituted aryl, alkyl with 1 to 14 carbon atoms or substituted alkyl; R_2 and R_3 represent hydrogen, alkyl, aryl, $—N(R_4)_2$, —S—R_4, —OR_4, or R_2 may represent hydrogen and R_3 represents alkyl, aryl, $—N(R_4)_2$, —S—R_4, OR_4, and R_4 and R_5 represents alkyl with 1 to 14 carbon atoms and R_6 alkyl with 1 to 14 carbon atoms, aryl, methyl-substituted aryl or halogen-substituted aryl, is used as a high-boiling solvent.

4,419,441

DISPERSION PROCESS

Fritz Nittel, Leverkusen, and Helmut Mäder, Odenthal, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 278,603, Jun. 29, 1981, abandoned. This application Apr. 11, 1983, Ser. No. 482,280

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, 3024881

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—377 **9 Claims**

1. A dispersion process of preparing a stable dispersion of a

hydrophobic substance in an aqueous medium using an oil former, comprising a plurality of dispersion steps

which comprises dispersing in a main dispersion step the total quantity of said hydrophobic substance together with from 0 to about 80% of the total amount of oil former in the aqueous medium and additionally in at least one additional dispersion step which precedes or follows said main dispersion step,

dispersing from about 20 to 100% of the total amount of oil former, in the absence of dispersing of said hydrophobic substance, in said aqueous medium,

so as to provide from said combined main and additional dispersion steps said stable dispersion of said hydrophobic substance in said aqueous medium.

9. Process as claimed in claim **1** in which the hydrophobic substance is a color coupler.

4,419,442

PHOTOSENSITIVE SILVER HALIDE EMULSION

Martin L. Falxa, Waltham, and Richard S. Himmelwright, Melrose, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 4, 1982, Ser. No. 439,077

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—567 **34 Claims**

1. Photosensitive silver halide grains comprising a shell of silver halide substantially surrounding a water-soluble, non-silver containing grain.

18. A method for forming photosensitive silver halide grains which comprises the steps of: (a) dispersing water-soluble, non-silver containing grains with a rock salt habit in an organic solvent in which said non-silver grains are insoluble; and, (b) adding a non-aqueous solution of a silver salt to said dispersion wherein silver halide is insoluble in said organic solvent.

4,419,443

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hiroyuki Mifune; Yoshiharu Fuseya, both of Kanagawa, and Shinpei Ikenoue, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

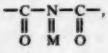
Filed Nov. 10, 1981, Ser. No. 320,045

Claims priority, application Japan, Nov. 11, 1980, 55/158518; May 14, 1981, 56/72654

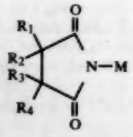
Int. Cl.³ G03C *1/28*

U.S. Cl. 430—600 **23 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer wherein the silver halide emulsion layer has been chemically-ripened in the presence of at least one compound containing a unit represented by the formula

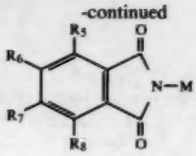


wherein M represents a hydrogen atom, an alkali metal atom, or NH_4, and further, wherein said compound is represented by formula (I), (II), (III) or (IV)

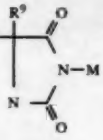


(I)

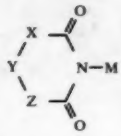
-continued



(II)

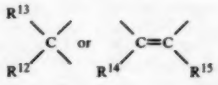


(III)

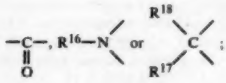


(IV)

wherein M is defined as above; and R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 each represent a hydrogen atom, a halogen atom, a nitro group, a sulfo group, a carboxy group, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or an alkoxy group; W represents —O—, —S— or R^{11}—N<; X represents



together with Y; Y represents —O—, —S—,



Z represents —O—, —S—, R^{19}—N< or

R^9, R^{10}, R_{12}, R^{13}, R^{14}, R^{15}, R^{17}, R^{19}, R^{20}, and R^{21} each represent a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, an alkoxy group, a halogen atom, a sulfo group, or a carboxy group; R^{14} and R^{15} may be connected to each other to form a condensed ring; and R^{11}, R^{16}, and R^{19} each represent a hydrogen atom or a substituted or unsubstituted alkyl group and wherein the silver halide emulsion is sensitized with a sulfur sensitizer or noble metal sensitizer.

4,419,444

NOVEL SUPPORTS CARRYING SIDE CHAINS, PROCESSES FOR OBTAINING THESE SUPPORTS, PROCESS FOR ATTACHING ORGANIC COMPOUNDS HAVING CARBOHYDRATE RESIDUES ONE SAID SUPPORTS, PRODUCTS AND REAGENTS RESULTING FROM SAID CHEMICAL FIXATION

Gerard A. Quash, Sainte Foy Les Lyon, France, assignor to Institut National de la Sante et de la Recherche Medicale-INSERM, Paris, France

Continuation of Ser. No. 934,003, Aug. 16, 1978, which is a division of Ser. No. 740,840, Nov. 11, 1976. This application Sep. 30, 1980, Ser. No. 192,479

Claims priority, application France, Nov. 13, 1975, 75 34627; Mar. 26, 1976, 76 08966; Aug. 27, 1976, 76 25898

Int. Cl.³ G01N *33/50;* **C12N** *11/00, 11/06, 11/08, 11/10, 11/12, 11/14*

U.S. Cl. 435—7 **36 Claims**

1. A process for agglutinating a biologically active analyte to an immunochemical reagent comprising

forming on an insoluble support base a side chain having from three to ten carbon atoms and at least one reactive $—NH_2$ group, by reacting a compound selected from the group consisting of diamines, polyamines, amino-acids, aliphatic hydrazines bearing an acid group, and aromatic hydrazines bearing an acid group with an insoluble support base bearing at least one carboxyl group or at least one amino group in the presence of a condensation agent to covalently bind said compound to said support base to form a side chain on said insoluble support base;

oxidizing into a CHO group at least one $—CH_2OH$ group of an organic compound having a carbohydrate residue; attaching the organic compound to said support by reacting said —CHO group with at least one reactive $—NH_2$ on said side chain to chemically attach the organic compound on said support; and

combining said analyte and said support under conditions suitable for agglutination.

4,419,445

METHOD FOR DETERMINING THE ACTIVITY OF CHOLINESTERASES

Yasushi Kasahara, Tama; Yoshihiro Ashihara, Fuchu; Masami Sugiyama, Hachioji, and Takahiro Harada, Ube, all of Japan, assignors to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,723

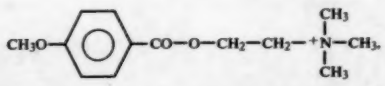
Claims priority, application Japan, Apr. 8, 1981, 56-51708

Int. Cl.³ C12Q *1/46, 1/26*

U.S. Cl. 435—20 **3 Claims**

1. A method for determining the activity of cholinesterase, comprising the steps of:

mixing a liquid containing cholinesterase with a solution containing p-methoxybenzoate demethylmonooxygenase, reduced nicotinamide adenine dinucleotide (NADH) and p-methoxybenzoyl choline cation having the formula:



under conditions effective to transform said p-methoxybenzoyl choline first to the corresponding p-methoxybenzoic acid and then to p-hydroxybenzoic acid and to convert said NADH to NAD^+, and measuring the decrease in absorbance of light caused by NADH, which decrease is caused by conversion of NADH to NAD^+.

4,419,446

RECOMBINANT DNA PROCESS UTILIZING A PAPILLOMA VIRUS DNA AS A VECTOR

Peter M. Howley; Nava Sarver, both of Bethesda, and Ming-Fan Law, Germantown, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Dec. 31, 1980, Ser. No. 221,565

Int. Cl.³ C12P *21/00, 19/34;* **C12N** *15/00, 1/00*

U.S. Cl. 435—68 **6 Claims**

1. A process for producing a recombinant DNA suitable for introduction and replication in eukaryotic cells comprising the steps of:

(a) cleaving bovine papilloma virus (BPV) type 1 or type 2 to produce a first linearized DNA segment selected from the group consisting of BPV-1 DNA cleaved at Bam HI; BPV-1 DNA cleaved at Hind III; BPV-2 DNA cleaved at Hind III; and the 69% subgenomic fragment; BPV_{69T} DNA, cleaved from BPV-1 DNA at Bam HI and Hind III,

(b) combining said first linear DNA segment with a second linear DNA segment containing a foreign gene and having termini ligatable to the termini of the first segment under joining conditions to join said first and second segments to provide a functional recombinant DNA.

3. A Eukaryotic cloning vector consisting essentially of the subgenomic fragment BP V_{69T} consisting of the 69 percent transforming region of bovine papilloma virus type 1 (BPV-1) cleaved from BPV-1 DNA at Bam HI and Hind III.

4,419,447

FERMENTATION PROCESS FOR PRODUCING DEMYCINOSYLTYLOSIN

Richard H. Baltz; Gene M. Wild, both of Indianapolis, Ind., and Eugene T. Seno, Norwich, England, assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 6, 1981, Ser. No. 260,961

Int. Cl.³ C12P *19/62;* **C12R** *1/54*

U.S. Cl. 435—76 **6 Claims**

1. The method of producing 23-demycinosyltylosin and 20-dihydro-23-demycinosyltylosin which comprises cultivating bacteria having the identifying taxonomic characteristics of *Streptomyces fradiae* NRRL 12170 and capable of producing 23-demycinosyltylosin in recoverable amounts in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of antibiotic activity is produced.

4,419,448

CONTINUOUS FERMENTATION IN SERIES OF MAIN VESSELS WITH AUXILIARY VESSEL PROVIDED

Rolf H. Kretz, Singen, Fed. Rep. of Germany, assignor to Process Engineering Company SA, Männedorf, Switzerland

Filed Jul. 20, 1981, Ser. No. 285,135

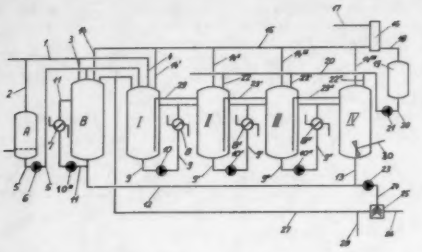
Claims priority, application Switzerland, Aug. 21, 1980, 6303/80

Int. Cl.³ C12P *7/06;* **C12M** *1/00*

U.S. Cl. 435—161 **10 Claims**

1. A method of producing alcohol by fermentation of a continuously supplied mash containing yeast and yeast nutrients, comprising the steps of successively transferring the mash through a series of separate fermentation vessels for fermentation therein during normal operation; diverting the further supply of mash at intervals and for a predetermined period of time into an intermittently operating auxiliary fermentation vessel for fermentation therein as the mash already present in

the series of fermentation vessels continues to be successively transferred through such series during modified operation; and



continuing the fermentation of the diverted mash in the auxiliary fermentation vessel until completion.

4,419,449

PROCESS FOR THE PRODUCTION OF A SUBSTANCE HAVING BACTERIOSTATIC ACTIVITY

Francois Maillard, and David Shepherd, both of Morges, Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 86,277, Oct. 19, 1979, abandoned. This application Feb. 2, 1981, Ser. No. 230,421

Claims priority, application Switzerland, Nov. 1, 1978, 11230/78

Int. Cl.[3] **C12P** *1/04;* **C12Q** *1/24;* **C12N** *1/20, 1/02*

U.S. Cl. 435—170 **5 Claims**

1. A process for the production of a substance having bacteriostatic activity, which comprises isolating one or more strains of Beggiatoa micro-organisms selected from the group consisting of the strains NCIB 114 18 to NCIB 114 25 from baregine, culturing the micro-organisms with agitation under aerobic conditions over a period of from 5 to 36 hours at a temperature of from 20° to 50° C. and at a pH-value of from 6 to 8 in an aqueous nutrient medium and collecting the biomass and/or the culture medium.

4,419,450

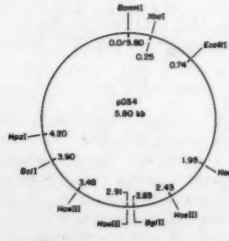
PLASMID CLONING VECTOR FOR *BACILLUS SUBTILIS*

Donald H. Dean, Worthington, and Margaret M. Dooley, Columbus, both of Ohio, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Apr. 21, 1982, Ser. No. 370,431

Int. Cl.[3] **C12N** *1/20, 1/00, 15/00*

U.S. Cl. 435—253 **2 Claims**



1. Essentially pure plasmid, pOS4, having erythromycin resistance and kanamycin resistance coding genes characterized by a molecular weight of approximately 5.8 kb and a restriction endonuclease cleavage map as shown in the drawing.

4,419,451

OXYGEN SCAVENGING SYSTEM FOR ANAEROBIOSIS

Richard L. Garner, and Luther Winans, Jr., both of Abilene, Tex., assignors to Becton Dickinson and Company, Paramus, N.J.

Filed May 21, 1981, Ser. No. 265,875

Int. Cl.[3] **C12M** *1/22;* **C09K** *3/00;* **C01B** *3/08, 15/16*

U.S. Cl. 435—298 **24 Claims**

1. A system for producing an atmosphere for use in culturing anaerobic microorganisms, characterized by

(a) a sealable container;

(b) a material in said container which when contacted by water generates a gas capable of reacting with oxygen to provide an atmosphere for culturing anaerobic microorganisms;

(c) said material being a metal-metal salt couple wherein said metal is selected from the group consisting of magnesium, beryllium, barium, strontium, and calcium and wherein said metal salt is selected from the group consisting of copper, platinum, palladium, tin, iron, nickel and cobalt; and

(d) catalytic means in said container for catalyzing reaction between oxygen and gas generated in said container.

4,419,452

METHOD OF DETECTING FLUORESCENT MATERIALS AND APPARATUS FOR THEIR DETECTION

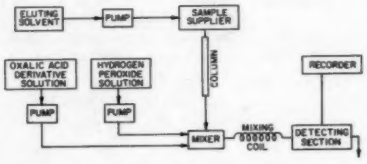
Kazuhiro Imai; Zenzo Tamura, both of Tokyo, and Shin-ichiro Kobayashi, Imiya, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 80,294, Oct. 1, 1979, abandoned. This application Aug. 12, 1981, Ser. No. 292,287

Claims priority, application Japan, Apr. 3, 1979, 54-39922

Int. Cl.[3] **G01N** *31/08, 21/76*

U.S. Cl. 436—89 **6 Claims**



1. A method for detecting amounts of a dansylamino acid in the range of 10^{-14} to 8×10^{-13} moles in a mixture, which comprises:

(a) separating dansylamino acid by liquid column chromatography to form a column eluate containing the separated dansylamino acid;

(b) continuously passing the column eluate to a first mixing zone;

(c) continuously mixing a solution of an oxalic acid derivative and a solution of hydrogen peroxide, each solution provided at a controlled rate, with the column eluate in the first mixing zone to form a first mixture;

(d) continuously passing the first mixture through a coiled mixing zone to form a second mixture; and

(e) continuously passing the second mixture through a chemiluminescence flow cell detector to detect the chemiluminescence resulting from the reaction of the mixture of solutions.

4,419,453

IMMUNOLOGICAL AGGLUTINATION ASSAYS WITH DYED OR COLORED LATEX AND KITS

Linneaus C. Dorman, Midland, Mich., and Leigh B. Bangs, Carmel, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 306,067, Sep. 28, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,528

Int. Cl.³ G01N *33/54, 33/76*

U.S. Cl. 436—534 31 Claims

1. In a method for detecting the presence of an immunochemical in a biological sample using an indirect latex agglutination test which comprises

(i) admixing an immunological counterpart of said immunochemical with said biological sample to form a reaction mixture;

(ii) allowing said reaction mixture to incubate for at least about one minute;

(iii) adding latex polymer particles, having said immunochemical bound thereto, to said reaction mixture; and then

(iv) determining if agglutination occurs by the aggregation of polymer particles;

the improvement which comprises:

(a) employing dyed latex polymer particles having said immunochemical bound thereto;

(b) carrying out said method in the presence of a water-soluble, non-latex polymer particle adsorbing dye that is contrasting in color to the dyed latex polymer particles; and

(c) determining if agglutination occurs by observing a color change in the reaction mixture which is characterized by the appearance of the true color of the dyed latex polymer particles, intensified by clumping or precipitation of the dyed latex polymer particles, and the appearance of the remainder of reaction mixture being that of the water-soluble, non-latex polymer particle adsorbing dye.

4,419,454

RAPID-FIRE REFRACTORIES

William G. Long, Lynchburg, and Helen H. Moeller, Concord, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 14, 1981, Ser. No. 329,903

Int. Cl.³ C04B *35/80*

U.S. Cl. 501—95 12 Claims

1. The method of removing moisture from a water containing calcium aluminate-bonded refractory mass without explosive spalling comprising the steps of; (a) mixing water, organic fibers and at least one inorganic material to create a refractory mixture, (b) casting, stamping or gunniting the mixture, (c) thereafter curing the mixture and (d) firing the mixture under rapid-fire conditions.

4,419,455

PACKING MATERIALS

Hiroshi Shikano, 3-24-6 Hiyoshidai, and Tsutomu Harada, 1612-4 Ohaza Kumate, both of Yahata Nishi-ku, Kitakyushu-Shi, Fukuoka-Ken, Japan

Filed Jan. 22, 1982, Ser. No. 341,756

Claims priority, application Japan, Jan. 27, 1981, 56/9580

Int. Cl.³ C04B *35/80*

U.S. Cl. 501—95 12 Claims

1. A high erosion resisting-airtight packing material which consists essentially of:

a blend consisting of 0.5–20 parts by weight of a low melting point metal based on 100 parts by weight weight of said blend, 3–10 parts by weight of fiber and the balance of at least one refractory powder, and

a binder in an amount varying depending upon the amount of said low melting point metal.

4,419,456

METHOD FOR THE DISPOSAL OF SHOT COKE

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,567

Int. Cl.³ C01B *3/02;* C07C *1/04;* C01B *3/06*

U.S. Cl. 518—703 9 Claims

1. A method for the disposal and utilization of shot coke in the form of hard-to-grind spherical particles of approximately 4 mm in diameter and having a Hardgrove grindability index of about 20 determined by the Hardgrove machine method ASTM D409-71 comprising:

A. contacting a first fluidized bed consisting essentially of said shot coke at elevated temperatures with oxygen and sufficient steam so as to produce a gaseous fuel product comprising a major amount of carbon monoxide and hydrogen, and

B. introducing said gaseous fuel product and oxygen into a second fluidized bed consisting essentially of shot coke, said oxygen being supplied in sufficient amount to combust the hydrogen to form water and to react with said hydrogen and carbon monoxide to yield heat to maintain the second bed of shot coke sufficiently hot to allow the regeneration of carbon monoxide and hydrogen by reaction of the shot coke in said second bed and the water formed in the second bed of shot coke.

4,419,457

PRODUCTION OF POLYURETHANE FOAMS

Mototsugu Tokunaga, Kyoto, Japan, assignor to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Sep. 30, 1982, Ser. No. 429,902

Claims priority, application Japan, Oct. 6, 1981, 56-159827

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—65 7 Claims

1. Method of producing an open-cell polyurethane foam comprising heating a mixture of an aqueous emulsion of a polyurethae-forming composition and a fluorocarbon compound of 1 to 3 carbon atoms having a boiling point of 5° to 100° C.

4,419,458

FIRE RETARDANT FINE PARTICULATE EXPANDABLE STYRENE POLYMERS

Josef K. Rigler, Recklinghausen; Ekkehard Wienhöfer, Marl; Horst Leithäuser, Marl, and Karl Trukenbrod, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Division of Ser. No. 380,071, May 20, 1982. This application Apr. 19, 1983, Ser. No. 486,430

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122341

Int. Cl.³ C08J *9/20, 9/22*

U.S. Cl. 521—56 4 Claims

1. In a particulate molding composition for the production of foamed articles consisting essentially of a mixture of an expanding agent, a fire-retardant organic halogen compound and a polymerized styrene monomer or styrene monomer in admixture with comonomers, the improvement comprising said composition containing about 0.0001 to 0.1 percent by weight based on said monomers and comonomers of an epoxidation product of an aliphatic hydrocarbon having an epoxidated aliphatic chain containing from 6 to 18 carbon atoms, said epoxidation product being soluble in said monomers.

4,419,459

PROCESS OF PRODUCING TRANSPARENT FOAMED PLASTICS MATERIALS

Bernd Melchior, Remscheid, Fed. Rep. of Germany, assignor to August Hohnholz KG, Hamburg, Fed. Rep. of Germany

PCT No. PCT/DE81/00012, § 371 Date Jul. 30, 1981, § 102(e) Date Jul. 30, 1981, PCT Pub. No. WO81/02018, PCT Pub. Date Jul. 23, 1981

PCT Filed Jan. 14, 1981, Ser. No. 287,744

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1980, 3001205

Int. Cl.³ C08J 9/22

U.S. Cl. 521—59 10 Claims

1. A process of producing transparent foamed plastics, comprising mixing (i) a polymerizable composition consisting essentially of methyl methacrylate and a polymerization catalyst and which does not contain a blowing agent, and (ii) at least one component selected from the group consisting of

(a) solid beads comprising a mixture of at least one transparent polymethylmethacrylate and blowing agent, and

(b) solid beads comprising at least one transparent polymethylmethacrylate with blowing agent containing micro-capsules enclosed therein,

heating and expanding said beads and polymerizing said polymerizable composition.

4,419,460

PHENOLIC FOAMS

Stanley S. Ho, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 219,165, Dec. 22, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,197

Int. Cl.³ C08J 9/14

U.S. Cl. 521—123 4 Claims

1. A foam composition having a density of 0.032 to 0.064 grams/cubic centimeter and a closed cell content of at least 50% comprising a resole with a formaldehyde to phenol mole ratio of from 1.2 to 2.5:1 and from 2 to 15% by weight, based on the resole weight, of finely divided hydrated alumina.

4,419,461

CATALYST FOR MAKING POLYURETHANES

Francis W. Arbir, Itasca; Daniel S. Raden, Hawthorn Woods; Kenneth W. Narducy, Bloomingdale, and Francois M. Casati, Highland Park, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 252,634, Apr. 9, 1981. This application Oct. 21, 1982, Ser. No. 435,842

Int. Cl.³ C08G 18/14

U.S. Cl. 521—126 6 Claims

1. The process of preparing a polyurethane foam from a polyisocyanate and a polyol using methylene chloride as a blowing agent, consisting essentially in carrying out the reaction in the presence of a catalytically effective amount of a partially blocked DMAPA, said partial blocking being caused by the inclusion of a branched octanoic acid present in the equivalent % of 10–50% of said DMAPA.

4,419,462

FOAMED THERMOPLASTIC RESIN COMPRISING POLY (P-METHYLENEBENZOATE)

Edward E. Paschke, Wheaton, and James L. Throne, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 445,435, Nov. 30, 1982. This application Apr. 18, 1983, Ser. No. 485,877

Int. Cl.³ B29H 7/29; C08J 9/10, 9/14

U.S. Cl. 521—134 7 Claims

1. A thermoplastic foamed resin product having a foaming level of from about 10% to about 50% characterized by high shear sensitivity, slow rate of crystallization and inherently high impact resistance which comprises a polymer composition of poly(p-methylenebenzoate) having an I.V. greater than 0.4 dl/g.

4,419,463

PREPARATION OF CROSS-LINKED HYDROGEL COPOLYMERS FOR CONTACT LENSES

Ivor B. Atkinson, 32 Mount Rd., Chessington, Surrey, and Barry C. Holdstock, 67, Northway, Morden, Surrey, both of England

Division of Ser. No. 98,479, Nov. 29, 1979, Pat. No. 4,361,657. This application Mar. 16, 1982, Ser. No. 358,552

Claims priority, application United Kingdom, Nov. 30, 1978, 46681/78

Int. Cl.³ G02C 7/04

U.S. Cl. 523—106 2 Claims

1. A method of producing a soft contact lens having a water content of at least about 30% by weight based on the weight of the hydrated lens which comprises:

(a) preparing a monomer mixture containing a major proportion of a hydroxyalkyl acrylate or methacrylate, up to 12% by weight of an unsaturated carboxylic acid, a minor proportion of a cross-linking monomer, from about 4 to about 30% by weight of styrene or a substituted styrene and a polymerisation initiator,

(b) removing oxygen from mixture,

(c) filling the mixture into a suitably-shaped mould and effecting polymerisation in the absence of oxygen and,

(d) converting free carboxylic acid groups in the resulting copolymer to salt form.

4,419,464

ERASABLE INK FOR BALL POINT PENS

Raymond S. Williams, Boulder City, Nev., and Paul C. Fisher, 711 Yucca St., Boulder City, Nev. 89005, assignors to Paul C. Fisher, Boulder City, Nev.

Continuation of Ser. No. 320,443, Nov. 12, 1981, Pat. No. 4,367,966. This application Jul. 29, 1982, Ser. No. 402,830

Int. Cl.³ C09D 11/18; C08K 5/05, 5/06

U.S. Cl. 523—161 9 Claims

1. An erasable writing ink suitable for use in a ball point pen comprising at least 10% by weight of an elastomer selected from the group consisting of polyvinyl acetate, a copolymer of ethylene and vinyl acetate, and mixtures thereof, from about 10% to about 40% by weight of trichloroethylene, and an effective amount of a colorant.

4,419,465

POLYMERIZATION PROCESS

Alan J. Backhouse, South Ascot; Charles Bromley, Bourne End, and Morice W. Thompson, Maidenhead, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 212,753, Dec. 4, 1980, Pat. No. 4,336,177. This application Dec. 2, 1981, Ser. No. 326,619

Claims priority, application United Kingdom, Dec. 6, 1979, 7942092

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.³ C08L 33/02

U.S. Cl. 523—201 11 Claims

1. A coating composition comprising a blend of:

(A) composite polymer microparticles having a diameter of from 0.1 to 10 microns, each of which comprises a core of crosslinked polymer surrounded by and grafted to a layer of non-crosslinked polymer, the microparticles being produced as a dispersion in a non-aqueous liquid medium as hereinbelow defined by a process comprising the steps of (1) polymerising one or more ethylenically unsaturated monomers, including at least one crosslinking monomer, from which the crosslinked core polymer of the microparticles is to be derived, in an aqueous medium comprising (a) at least 30% by weight of water and (b) not more than

70% by weight of a second constituent which is miscible with water, the nature and proportion of which are such that the mixture as a whole is capable of dissolving the monomer or monomers being polymerised to the extent of at least 3% by weight but is a non-solvent for the polymer formed, the polymerisation being carried out in the absence of ionic species and at a temperature at least 10° C. higher than the glass transition temperature of the core polymer, in the presence in the aqueous medium as steric stabiliser of a block or graft copolymer which contains in the molecule a polymeric component which is solvatable by the aqueous medium and another polymeric component which is not solvatable by the aqueous medium and is capable of becoming associated with the polymer particles formed, the concentration of free monomer in the polymerisation mixture being maintained throughout this process step at a level such that at no time does the free monomer form a separate phase and the total amount of monomer polymerised being such that the resulting dispersion contains at least 20% by weight of microparticles, (2) polymerising, in the dispersion obtained from step (1) and again in the absence of ionic species, one or more further ethylenically unsaturated monomers, not including any crosslinking monomer, from which the non-crosslinked polymer of the outer layer is to be derived, optionally in the presence of additional block or graft copolymer stabiliser, the concentration of such further monomer in the free state in the polymerisation mixture being maintained at a level such that at no time does that free monomer form a separate phase, and (3) transferring the polymer microparticles from the resulting dispersion into a non-aqueous liquid medium which is a solvent for the non-crosslinkable polymer under such conditions that the particles become stably dispersed therein, with

(B) a main film-forming constituent which is compatible with the non-crosslinked polymer component of the microparticles.

4,419,466

METHOD FOR CONTINUOUS PRODUCTION OF INVERT EMULSION POLYMERS

Thomas R. Hopkins, Chesterland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jun. 25, 1981, Ser. No. 277,300

Int. Cl.³ C08J *3/10*

U.S. Cl. 523—324 **18 Claims**

1. A method for preparing an invert emulsion polymer which comprises the steps of:

(I) continuously circulating, in a loop reactor, under polymerization conditions, a system comprising

(A) a non-polar liquid which is inert to addition polymerization, and

(B) an aqueous solution of one or more polymerizable monomers;

(II) continuously adding components A and B to said system under conditions and in proportions to produce said invert emulsion polymer; and

(III) continuously withdrawing a portion of said circulating system comprising said invert emulsion polymer.

4,419,467

PROCESS FOR THE PREPARATION OF CATIONIC RESINS, AQUEOUS, DISPERSIONS, THEREOF, AND ELECTRODEPOSITION USING THE AQUEOUS DISPERSIONS

Marco Wismer, Gibsonia, and Joseph F. Bosso, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 14, 1981, Ser. No. 301,712

Int. Cl.³ C08L *63/02*

U.S. Cl. 523—414 **14 Claims**

1. In a process for preparing a resin which contains cationic base groups comprising reacting a polyepoxide resin with a cationic base group former and dispersing the resulting cationic resin in aqueous medium, the improvement comprising:

contacting a polyepoxide with a polyether polyol and heating the two together to form the polyepoxide resin, said polyether polyol formed from reacting:

(A) a cyclic polyol with

(B) ethylene oxide or a mixture of ethylene oxide and an alkylene oxide having 3 to 8 carbon atoms in the alkylene chain;

the equivalent ratio of (B) to (A) being within the range of 3 to 20:1.

4,419,468

ELECTRODEPOSITABLE COMPOSITIONS

Joseph P. Lucas, Wexford, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 269,132, Jun. 1, 1981, abandoned. This application Dec. 2, 1982, Ser. No. 446,127

Int. Cl.³ C08L *63/02*

U.S. Cl. 523—426 **5 Claims**

1. A cationic electrodepositable coating composition comprising:

(A) an aqueous cationic paint dispersion, and further consisting essentially of:

(B) an organic polycarboxylic acid or a salt thereof, said acid or salt being present in an amount sufficient to reduce discoloration of a coating due to metallic ions in the paint.

4,419,469

THERMOPLASTIC ELASTOMER BLENDS WITH BITUMEN

Georg G. A. Böhm; Lee E. Vescelius, and Gary R. Hamed, all of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 1,623, Jan. 8, 1979, Pat. No. 4,250,273, which is a continuation-in-part of Ser. No. 879,308, Jan. 21, 1978, abandoned, which is a division of Ser. No. 806,036, Jun. 13, 1977, abandoned. This application Apr. 16, 1980, Ser. No. 140,905

Int. Cl.³ C08L *95/00*

U.S. Cl. 524—68 **5 Claims**

1. A theromplastic elastomer composition comprising, a blend of

from about 30 to about 45 parts by weight of a crystalline 1-olefin polymer, said 1-olefin polymer selected from the class consisting of a homopolymer of polyethylene, polypropylene, and a copolymer made from monomers of ethylene and propylene, said homopolymer or said copolymer having a melting point of at least 90° C.;

from about 65 to about 25 parts by weight of a random styrene-butadiene rubber;

from about 10 to about 40 parts by weight of a bitumen,

wherein said bitumen is an asphalt, a tar, or a tar derivative,

said asphalt selected from the group consisting of a petroleum asphalt, a native asphalt, and combinations thereof,

said petroleum asphalt selected from the group consisting of straight-reduced asphalts, thermal asphalts, and air-blown asphalts,

said native asphalts selected from the group consisting of an asphalt with a mineral content below 5 percent, an asphalt with a mineral content above 5 percent, and combinations thereof,

said tar selected from the group consisting of a coal tar reduced to float grade, a coal-tar pitch, and combinations thereof,

said tar derivative being a residual from pyrogenous distillates, and

said blend forming a thermoplastic elastomer, said thermoplastic elastomer capable of being repeatedly reprocessed.

4,419,470

WOOD DERIVED, THERMOPLASTIC ESTER MIXTURES AS A SUBSTITUTE FOR PETROLEUM-DERIVED COMPONENTS IN COMPOUNDED RUBBER STOCKS

James A. Davis, Uniontown, and Robert C. Koch, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 193,198, Oct. 2, 1980, Pat. No. 4,324,710. This application Mar. 19, 1982, Ser. No. 359,739

The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclosed.

Int. Cl.[3] **C08L** *93/04;* **C09F** *1/00*

U.S. Cl. 524—76 **11 Claims**

1. An improved rubber stock containing conventional rubber components, wherein the improvement comprises replacing at least a portion of a petroleum derived product in the stock with a thermoplastic resin, said resin comprising carboxylic acid ester groups and derived from wood and both said petroleum-derived product and said resin not being elastomeric and being a minor portion of the stock.

4,419,471

CORE-SHELL POLYMERS

Suzanne Nelsen, Bergenfield, N.J.; Yehuda Ozari, Louisville, Ky.; Dru Alwani, Wayne, N.J., and Edward Wotier, Chattanooga, Tenn., assignors to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 299,464, Sep. 4, 1981, abandoned, which is a continuation of Ser. No. 115,649, Jan. 28, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 429,593

The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.

Int. Cl.[3] **C08K** *5/34, 5/13*

U.S. Cl. 524—100 **6 Claims**

1. A core-shell polymer composition comprising:

(a) discrete cores of styrene-butadiene copolymer having antioxidant intimately mixed therein in amounts effective to improve the stability of the copolymer to oxidation; and

(b) shells of a copolymer formed from:

(1) at least one monomer selected from the group consisting of alkyl methacrylates and alkyl acrylates; and

(2) an ultraviolet light stabilizer containing a copolymerizable vinyl group or a copolymerizable group which is a reactive precursor of an alkyl group;

said shells completely surrounding said cores.

4,419,472

PIPERIDINE COMPOSITIONS FOR LIGHT STABILIZATION

Godwin Berner, Rheinfelden; Manfred Rembold, Basel, and Jean Rody, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 16, 1981, Ser. No. 322,041

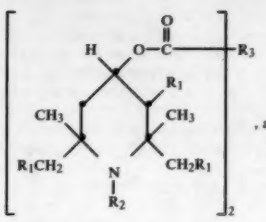
Claims priority, application Switzerland, Nov. 17, 1980, 8520/80

Int. Cl.[3] **C08K** *5/34;* **C07D** *401/12, 401/06*

U.S. Cl. 524—102 **9 Claims**

1. A composition, which is a mixture of esters of the formulae I and II, which comprises

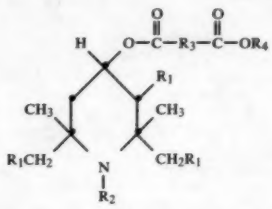
(a) 90–70% by weight of an ester of formula I



(I)

, and

(b) 10–30% by weight of an ester of formula II



(II)

in which R_1 is hydrogen or methyl, R_2 is hydrogen, C_{1-12} alkyl, C_{3-8} alkenyl, C_{7-11} aralkyl, cyanomethyl or C_{2-4} acyl, R_3 is C_{1-18} alkylene, C_2-C_{18} oxaalkylene, C_{2-18} thiaalkylene, C_{2-18} azaalkylene or C_{2-8} alkenylene and R_4 is C_{1-4} alkyl.

8. Plastics material which has been stabilised against photochemical degradation and which contains, as stabiliser, 0,1 to 5% by weight of a composition according to claim 1.

4,419,473

POLYOLEFIN PLASTIC COMPOSITIONS HAVING IMPROVED TRANSPARENCY

Robert L. Mahaffey, Jr., Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 275,561, Jun. 22, 1981, abandoned. This application May 20, 1982, Ser. No. 380,370

Int. Cl.[3] **C08K** *5/34*

U.S. Cl. 524—104 **7 Claims**

1. A polyolefin plastic composition having improved transparency, which comprises:

(a) a major portion of a linear, low density polyethylene polymer;

(b) a di-acetal of sorbitol and an aromatic aldehyde in an amount sufficient to improve transparency characteristics;

(c) a di-acetal decomposition inhibitor selected from metal sequestrants and acid neutralizers in an amount sufficient to inhibit decomposition of said di-acetal; and

(d) said linear, low density polyethylene polymer further containing high acid catalyst residue in an amount sufficient to cause decomposition of said di-acetal.

4,419,474

FLAME-REPELLENT POLYSILOXANE MOLDING COMPOSITIONS

Jürgen Ackermann, Bergisch-Gladbach; Hans-Heinrich Moretto, Cologne; Wilfried Kniege, Bergisch-Gladbach, and Werner Rauer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 20, 1981, Ser. No. 313,112

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1980, 3041588

Int. Cl.³ C08L *83/06*

U.S. Cl. 524—195 **4 Claims**

1. In a polysiloxane molding composition which can be cured to give flame-repellent products, comprising

(a) a diorganopolysiloxane of the formula

$$R_n^1SiO_{\frac{4-n}{2}}$$

in which

n is 1.9 to 2.05, and

R^1 is an alkyl, alkenyl and/or aryl radical with 1–8 C-atoms,

(b) a finely divided silicic acid,

(c) finely divided TiO_2 with a surface area, measured by the BET method, greater than 20 m^2/g and a particle size less than 0.5 um,

(d) platinum and/or one of its sulphur-free compounds, and

(e) a curing agent,

the improvement which comprises about 0.05 to 10% by weight of (a) to (e) of a nitrogen compound selected from the group consisting of a cyanoguanidine and an arylguanidine or a salt thereof.

4,419,475

HEAT RESISTANT ETHYLENE-PROPYLENE RUBBER WITH IMPROVED TENSILE PROPERTIES AND INSULATED CONDUCTOR PRODUCT THEREOF

Joseph E. Vostovich, Bridgeport, Conn., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 208,725, Nov. 20, 1980, Pat. No. 4,303,574, which is a continuation of Ser. No. 50,036, Jun. 19, 1979, abandoned. This application Aug. 3, 1981, Ser. No. 289,611

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.³ C08K *5/54*

U.S. Cl. 524—264 **6 Claims**

1. A curable ethylene-propylene rubber composition having improved tensile and related physical properties, resistance to heat and apt electrical and physical properties, consisting essentially of the combination in approximate parts by weight of:

Ethylene-propylene rubber	100
Chlorosulfonated polyethylene	3–10
Zinc Oxide	15–30
Talc	50–125
Vinyl silane	0.5–3
Carbon black	10–32
Antimony oxide	3–10
Amine antioxidant	1–4
Imidazole antioxidant	0.2–4
Peroxide curing agent	2–8
Curing coagent	2–5

4,419,476

TERNARY ADHESIVE SYSTEMS

James E. Coughlin, Philadelphia, Pa.; Eugene G. Sommerfeld, Mt. Laurel, N.J., and Clifford H. Strolle, Springfield, Pa., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 310,069, Oct. 9, 1981, abandoned. This application Aug. 9, 1982, Ser. No. 404,981

Int. Cl.³ C08G *18/10*

U.S. Cl. 524—284 **39 Claims**

1. A ternary adhesive system consisting essentially of:

A. at least one hydroxyl-terminated polymeric polyol having a molecular weight M_n of about 1,000–5,000 and soluble in methyl ethyl ketone or ethyl acetate to the extent of at least 65% by weight;

B. an isocyanate-capped polyol-urethane formed from at least one polyol having a molecular weight M_n of about 500–4,000 which has been extended and capped with a diisocyanate in the —NCO/—OH ratio of 2/1–1.3/1 and is capable of forming a block copolymer with and thereby extending polyol A; and

C. a polyisocyanate crosslinking agent C supplying 6–50% by weight in a mixture of B plus C.

4,419,477

POWDER PHENOLIC RESIN COMPOSITION FOR DRY PROCESS RESIN-BONDED FELT

Yukio Saeki, and Naomitsu Inoue, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,199

Claims priority, application Japan, Oct. 5, 1981, 56-157464

Int. Cl.³ C08L *61/10*

U.S. Cl. 524—290 **7 Claims**

1. A powdered phenolic resin composition for resin-bonded felt produced by the dry process comprising a phenol-aldehyde resin, an aromatic carboxylic acid having a formula R—Ar—COOH present in the range of about 0.3 to 5% of the phenol-aldehyde resin and the composition having a bulk density of about 0.29–0.36 g/cm^3, wherein

R is selected from hydrogen, hydroxy or alkoxy groups,

Ar is selected from phenyl, phenylalkenyl or phenylalkyl groups.

4,419,478

THERMOPLASTIC MOLDING MATERIALS

Franz Brandstetter, Neustadt; Adolf Echte, Ludwigshafen; Herbert Naarmann, Wattenheim, and Edmund Priebe, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 5, 1982, Ser. No. 365,519

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1981, 3114915

Int. Cl.³ C08K *5/10*

U.S. Cl. 524—318 **5 Claims**

1. A thermoplastic molding material based on impact resistant styrene polymer prepared by the polymerization of monostyrene in the presence of polybutadiene rubber and polyphenylene ether wherein the molding material contains 0.1 to 5 percent by weight, based on the weight of the mixture of the styrene polymer and the polyphenylene ether, of an ester of an aliphatic monocarboxylic acid having 8 to 30 carbon atoms and an aliphatic or aromatic hydroxy compound having 1 to 6 hydroxyl groups and homogeneously mixing said molding material.

4,419,479

REINFORCED CARBOXY NITRILE POLYMER COMPOSITIONS CONTAINING PARTICULATE NICKEL

Virgil E. Springer, Corsicana, Tex., assignor to Regal International, Inc., Corsicana, Tex.

Filed Jan. 14, 1983, Ser. No. 458,029

Int. Cl.³ C08K 3/08, 5/33; C08G 79/00; C08F 220/46

U.S. Cl. 524—413 22 Claims

1. A reinforced polymer carboxylated nitrile composition comprising a minor effective amount of a particulate nickel metal reinforcing agent.

4,419,480

SOFT, FATIGUE RESISTANT ELASTOMER ARTICLES

Ronald J. Tabar, Amherst, Mass., and Paul C. Killgoar, Jr., Livonia, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 192,782, Oct. 1, 1980, abandoned. This application Aug. 19, 1982, Ser. No. 409,486

Int. Cl.³ C08K 3/04

U.S. Cl. 524—525 15 Claims

1. A soft, fatigue resistant vulcanizate adapted for transmitting a load between moving mechanical parts comprising (a) 100 parts by weight crosslinked elastomer, (b) about 10–75 parts by weight of substantially internally uncrosslinked, substantially linear polymer that (i) is made from monomers consisting essentially of isobutylene, (ii) is a strain crystallizable elastic solid at 20° C. and (iii) has a viscosity average molecular weight (Flory) above about 1.3 million, (c) about 5–200 parts by weight particulate comprising carbon black reinforcing particulate, said elastomer being crosslinked with (d) curative in an amount sufficient to crosslink said elastomer, wherein said polymer of (b) is dispersed throughout said elastomer of (a) in a discrete microscopic phase.

4,419,481

SMALL PARTICLE SIZE LATEX USEFUL AS A PRESSURE SENSITIVE ADHESIVE

James E. Schwartz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 251,008, Apr. 3, 1981. This application Nov. 1, 1982, Ser. No. 438,183

Int. Cl.³ C08L 47/00

U.S. Cl. 524—551 15 Claims

1. A pressure-sensitive adhesive formulation comprising a blend of

(a) an aqueous synthetic polymer latex comprising disperse polymer particles having a number average diameter of less than about 120 nm, as measured by hydrodynamic chromatography calibrated by electron microscopy, and which individually comprise:

(i) a soft monomer, a homopolymer of which would have a glass transition temperature of less than about 25° C., in an amount to impart stickiness to the latex,

(ii) a hard monomer, a homopolymer of which would have a glass transition temperature of greater than about 25° C., in an amount to impart strength to the latex; and

(b) a tackifying amount of a tackifying resin.

4,419,482

PRODUCTS CONTAINING POLYMER CHAINS, THE PREPARATION AND USE THEREOF

Philippe J. Teyssie, Neuville-en-Condroz; Robert J. Jerome, Tilff-Esneux, and Guy J. Broze, Grace-Hollogne, all of Belgium, assignors to Unibra Societe Anonyme, Brussels, Belgium

Filed Feb. 2, 1982, Ser. No. 345,102

Claims priority, application Luxembourg, Feb. 2, 1981, 83106

Int. Cl.³ C08K 5/01

U.S. Cl. 524—560 26 Claims

1. A process for preparing products containing polymer chains, in which a linear α,ω-diacid prepolymer or polymer selected from the group consisting of polydienes, polyolefins, polyvinyl polymers, polyacrylic polymers, polyalkylene oxides and polysiloxanes having, only at each chain end, at least one free acid group selected from the the group consisting of carboxylic, sulfonic and phosphonic groups is reacted with an alkoxide of a metal (M) having a valence of more than 2, the amount of alkoxide being such that said alkoxide functional groups are in excess of more than 1 with respect to the stoichiometric quantity of the acid functional groups carried by said linear polymer or prepolymer, the reaction mixture being stirred in the presence of humidity until a product is obtained, in which the hydrogen atoms of the acid groups of said linear prepolymer or polymer are substituted by an atom of the metal which is itself linked to another atom of this metal by M-O-M linkages.

4,419,483

PROCESS FOR PREPARING WATER-IN-OIL EMULSIONS

Michael J. Yanutola, Rock Hill, S.C., assignor to Sun Chemical Corporation, New York, N.Y.

Filed May 24, 1982, Ser. No. 381,033

Int. Cl.³ C08K 3/38

U.S. Cl. 524—701 10 Claims

1. In a process for making water-in-oil emulsions of polymers or copolymers of at least one water-soluble ethylenically unsaturated monomer by the steps of (1) forming a water-in-oil emulsion of said monomer or comonomers or aqueous solution thereof in an inert hydrophobic liquid organic dispersion medium containing an emulsifying agent and (2) heating said emulsion under free radical-forming conditions to polymerize said monomer or comonomers in a disperse phase, the improvement which consists of including sodium borate in the aqueous phase of said water-in-oil emulsion.

4,419,484

ORGANOPOLYSILOXANE MOLDING COMPOSITIONS

Hans Sattlegger, Odenthal; Karl Schnurrbusch, and Theo Achtenberg, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 22, 1982, Ser. No. 341,929

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1981, 3104645

Int. Cl.³ C08K 5/54

U.S. Cl. 524—731 4 Claims

1. In a one component organopolysiloxane molding composition, which in the presence of water or steam crosslinks to give elastomers, comprising

(A) an α,ω-dihydroxyorganopolysiloxane of a viscosity of about 500 to 2,000,000 cP (20° C.)

(B) a crosslinking agent,

(C) a filler, pigment and/or conventional auxiliary, and

(D) optionally a hardening catalyst,

(E) the improvement which comprises about 0.1 to 15% by weight of the total composition of hexamethyldisiloxane whereby the composition is capable of prolonged storage in the absence of moisture without loss of properties.

4,419,485

SHAPED ARTICLES AND PROCESS FOR THE PRODUCTION THEREOF

Willem F. H. Borman; Morton Kramer, and Eugene P. Reilly, all of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 144,536, Apr. 28, 1980, abandoned, which is a continuation of Ser. No. 610,094, Sep. 2, 1975, abandoned, which is a continuation of Ser. No. 382,512, Jul. 25, 1973, abandoned. This application Jan. 12, 1981, Ser. No. 223,943

Int. Cl.[3] C08G *63/76;* C08F *283/00;* C08L *67/00*

U.S. Cl. 525—437 13 Claims

1. A hollow shaped article blow molded from a composition comprising a branched, high molecular weight poly(1,4-butylene terephthalate) resin including from 0.05 to 3 mole %, based on the terephthalate units, of a branching component which contains at least three ester-forming groups.

4,419,486

SULPHONATED POLYARYLETHERKETONES

John B. Rose, Letchworth, England, assignor to Imperial Chemical Industries PLC, London, England

Filed May 26, 1981, Ser. No. 267,288

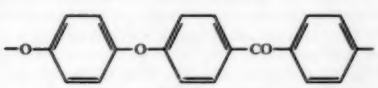
Claims priority, application United Kingdom, Jun. 10, 1980, 8018915

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.[3] C08G *65/40, 65/48*

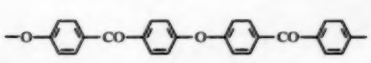
U.S. Cl. 525—534 9 Claims

1. A polyaryletherketone copolymer which is a hydrophilic sulphonated copolymer derived by controllably sulphonating a copolymer with concentrated sulfuric acid (98% w/w) at ≧50° C., said copolymer having repeat units of formula



A

together with repeat units of formula



B

at leat 70% of the units A being sulphonated after sulphonation and substantially all the units B remaining non-sulphonated after sulphonation, the control being effected by varying the proportion of the repeat units B in the copolymer of repeat units A and B.

4,419,487

TOUGHENED POLYESTER RESINS

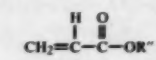
Eugene H. Rowe, Moab, Utah, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 156,849, Jun. 5, 1980, abandoned. This application Apr. 22, 1982, Ser. No. 370,769

Int. Cl.[3] C08L *67/06*

U.S. Cl. 525—38 10 Claims

1. Composition of matter comprising a reaction product of an unsaturated polyester resin and a carboxyl-terminated reactive liquid polymer wherein said polyester resin is selected from polyesters of polyhydric alcohols and carboxylic acids or their anhydrides, amount of said liquid polymer being sufficient to improve toughness in terms of crack and/or impact resistance of said composition without significantly deteriorating other mechanical properties, said liquid polymer having a backbone comprising one or more polymerized vinylidene monomers selected from (a) monoolefins containing 2 to 14 carbon atoms, (b) dienes containing 4 to 10 carbon atoms, (c) vinyl and allyl esters, (d) vinyl and allyl ethers, and (e) acrylates of the formula



where R″ is hydrogen, alkyl radical of 1 to 18 carbon atoms or an alkoxyalkyl, alkylthioalkyl, or cyanoalkyl radical containing 2 to 12 carbon atoms; the polybutadiene in said liquid polymer containing polybutadiene in the backbone being substantially 1,4-polybutadiene.

4,419,488

PROCESS FOR CONTINUOUS PRODUCTION OF HIGH IMPACT POLYSTYRENE

Chihiro Fukumoto, Kodaira; Tokinobu Furukawa, and Chikao Oda, both of Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1982, Ser. No. 366,303

Claims priority, application Japan, Apr. 15, 1981, 56-55568

Int. Cl.[3] C08F *279/00, 279/02*

U.S. Cl. 525—53 7 Claims

1. A process for continuously producing a high impact polystyrene which comprises:

a step of feeding rubber and styrene monomer continuously to a multistage horizontal rubber dissolving tank to dissolve the rubber completely with stirring by increasing the temperature of each stage along the direction of the liquid flow therethrough to provide a rubber solution,

a step of feeding the rubber solution to a first multistage horizontal type polymerizer operating at a temperature of from 100° to 200° C. to effect phase inversion of the rubber and preliminary polymerization of styrene, thereby providing a conversion of 25 to 40% by weight at the outlet of said first polymerizer,

a step of feeding the resulting preliminary polymerized solution to one or more horizontal type polymerizers successively to undergo bulk polymerization at a temperature of from 100° to 230° C. while removing the heat generated therein by spraying styrene monomer over the exposed surface of the polymerization solution and evaporating the monomer to attain a conversion of about 70 to 85% by weight at the polymerization solution outlet of a final polymerizer, and

a step of feeding the polymerization solution to a monomer separator to remove the remaining monomer.

4,419,489

EASILY EMULSIFIABLE ACRYLAMIDE AND RUBBER MODIFIED ASPHALTS

Anthony V. Grossi, Newark; Leon A. Hagelee, Minerva Park; Louis T. Hahn, and Alfred Marzocchi, both of Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 329,902, Dec. 11, 1981, Pat. No. 4,394,481. This application Dec. 27, 1982, Ser. No. 453,029

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.[3] C08F *216/06*

U.S. Cl. 525—54.5 14 Claims

1. As a composition of matter, the product produced by reacting an acrylamide, asphalt having a viscosity of less than about 120,000 cps (at 140° F.), a vinyl aromatic monomer and a rubbery polymer.

4,419,490

POLYMERIC HYDROGENATION CATALYSTS, THE PRODUCTION THEREOF AND THEIR USE TO PROMOTE HYDROGENATION

Ernst Bayer, and Wilhelm Schumann, both of Tubingen, Fed. Rep. of Germany, assignors to Heyl & Co. Chemisch-Pharmazeutische Fabrik, Fed. Rep. of Germany

Continuation of Ser. No. 62,760, Aug. 1, 1979, abandoned. This application Jun. 12, 1981, Ser. No. 273,068

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1978, 2835943; May 10, 1979, 2918942

Int. Cl.³ C08F *8/42*

U.S. Cl. 525—61 **18 Claims**

1. As a polymeric hydrogenation catalyst soluble in at least one solvent selected from the group consisting of water, methanol, propanol, N-methylpyrrolidone and mixtures thereof, a synthetic or semi-synthetic polymer having as a metal binding functional group a sulfonic acid, carbonyl, carboxyl, amino, imino, hydroxyl, cyano or acid amide group and being directly bound by covalent or secondary valent bonds by said metal binding functional group to a metal or salt of said metal, the metal being of the eighth subgroup of the periodic system, said polymer being selected from the group consisting of polyvinyl alcohol, polyacrylonitrile, polyacrylic acid, polyvinyl pyrrolidone, carboxymethyl cellulose, polyethylene glycols, polypropylene glycols, polyurethanes, polyvinyl amines, polyethylene imines, polyamides, polypeptides and polymeric polyhydroxy compounds, and mixtures of said polymers.

4,419,491

THERMOPLASTIC RESIN COMPOSITION EXCELLENT IN COLOR DEVELOPMENT

Hajime Sakano, Osaka; Fumio Nakai, Shiga, and Yukio Tomari, Osaka, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Japan

Filed Feb. 23, 1982, Ser. No. 351,553

Claims priority, application Japan, Feb. 23, 1981, 56-26000; Mar. 4, 1981, 56-31715; Mar. 12, 1981, 56-35870; Mar. 27, 1981, 56-46078

Int. Cl.³ C08L *51/04, 69/00, 33/12, 25/12*

U.S. Cl. 525—67 **10 Claims**

1. A thermoplastic resin composition which comprises

(A) a graft polymer comprising an ethylene-propylene elastomeric polymer and units of at least two kinds of monomers chosen from aromatic vinyl compounds, vinyl cyanide compounds and other copolymerizable monomers grafted thereon and,

(A′) a copolymer consisting of copolymerized monomer units comprising at least one aromatic vinyl compound and at least one vinyl cyanide compound and other copolymerizable monomers in a weight proportion of 55:45 to 85:15 and having an intrinsic viscosity of 0.40 to 1.10 (determined in dimethylformamide at 30° C.),

the weight proportion of the graft polymer (A) and the copolymer (A′) being from 5:95 to 80:20, with

(B) a methyl methacrylate polymer consisting of copolymerized monomer units comprising at least about 50% by weight methyl methacrylate units,

the proportion of the combined weight of the graft polymer (A) and the copolymer (A′) and the weight of the methyl methacrylate polymer (B) being from 5:95 to 95:5.

4,419,492

PROCESS FOR PREPARING ABS POLYMERIC POLYBLENDS

Robert H. M. Simon, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 6, 1981, Ser. No. 290,645

Int. Cl.³ C08L *51/00, 53/00*

U.S. Cl. 525—71 **25 Claims**

1. A process for producing ABS polymeric polyblends having dispersed alkadiene rubber particles grafted with monovinylidene aromatic and alkenenitrile monomers, said rubber particles having a bimodal rubber particle size distribution and being dispersed in a matrix copolymer of said monomers, the sequential steps: consisting essentially of:

A. grafting by aqueous emulsion graft polymerization an alkadiene rubber with a monovinylidene aromatic monomer and an alkenenitrile monomer to produce first graft rubber particles in an aqueous latex having a particle size of about 0.01 to 0.8 microns,

B. mixing with said latex, having 30 to 400 parts per hundred parts of latex rubber solids by weight, at least one additional monoethylenically unsaturated monomer selected from the group consisting of monovinylidene aromatic monomers and alkenenitrile monomers,

C. extracting said first grafted rubber particles from said aqueous latex into the additional monomer forming a dispersion of said particles in the additional monomer, and leaving a separate free water phase,

D. separating said free water phase from said additional monomer containing the first grafted rubber particles and adjusting said additional monomer with at least one monoethylenically unsaturated monomer such that the weight ratio of monoethylenically unsaturated aromatic to alkenyl nitrile monomer is about 80:20 to 20:80,

E. subjecting said first grafted rubber particles dispersed in said adjusted additional monomer having said weight ratio to mass polymerization conditions to produce a composition comprising said grafted rubber particles dispersed in a first matrix copolymer of said adjusted additional monomers as a first melt,

F. mixing said first melt with a second melt prepared by mass polymerization forming a second matrix copolymer of monovinylidene aromatic and alkenyl nitrile monomers having second grafted rubber particles dispersed therein, said second particles having a rubber particle size of about 1.0 to 10 microns being grafted with alkenyl nitrile and monovinylidene aromatic monomers forming a third melt having said first and second grafted rubber particles dispersed in said first and second matrix copolymers,

G. devolatilizing said third melt so as to remove unreacted monomers providing said ABS polyblend comprising said first and second matrix copolymers having said first and second grafted rubber particles dispersed therein such that said rubber particles have a bimodal particle size distribution.

4,419,493

SULFUR-VULCANIZABLE BLENDS OF ETHYLENE-VINYL ACETATE COPOLYMER ELASTOMERS AND POLYACRYLATE ELASTOMERS

Eugene Y. C. Chang, Bridgewater, and Rudolf A. Behrens, Somerset, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 21, 1982, Ser. No. 435,827

Int. Cl.³ C08L *13/00, 51/04, 31/04, 33/08*

U.S. Cl. 525—76 **20 Claims**

1. A sulfur-vulcanizable elastomer composition comprising:

(A) from about 35 to 65 percent, by weight, of a graft elastomer comprising about 18 to 80 percent, by weight, of a copolymer of ethylene and vinyl acetate having grafted thereon about 82 to 20 percent, by weight, of a mixture of a major proportion of ethyl acrylate and a minor proportion of an ethylenically unsaturated comonomer containing a cure-site for sulfur vulcanization, said copolymer of ethylene and vinyl acetate comprising, before grafting, about 50 to 92 percent, by weight, of ethylene and about 8 to 50 percent, by weight, vinyl acetate, and

(B) from about 65 to 35 percent, by weight, of a sulfur vulcanizable polyacrylate elastomer comprising (1) a C_1–C_8 alkyl acrylate, a mixture of C_1–C_8 alkyl acrylates, or a mixture of one or more C_1–C_8 alkyl acrylates and up to about 20%, by weight, based on the total weight of acrylate, of an acrylate or methacrylate, and (2) vinyl chloroacetate.

4,419,494

HEAT RESISTANT HOT MELT ADHESIVES

Paul P. Puletti, Glen Gardner, and Catherine E. Stubler Salerno, Stirling, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Mar. 16, 1982, Ser. No. 358,758
Int. Cl.[3] C08L *93/00, 93/04;* C08J *25/00*
U.S. Cl. 525—95 11 Claims

1. A hot-melt adhesive composition with improved heat resistance comprising 10–55% of a block copolymer having the general configuration A-B-A wherein A is a non-elastomeric polymer block derived from the moieties of a monovinyl aromatic hydrocarbon monomer, and B is an elastomeric polymer block derived from the moieties of a conjugated diene monomer or a hydrogenated derivative thereof; 20–70% of a tackifying resin; 0–25% plasticizing oil; 0–50% wax diluent; and 0–3% antioxidant; wherein the improvement comprises the present of 1–20% of a polymeric fatty acid polyamide.

4,419,495

EPOXY RESIN POWDER COATINGS HAVING LOW GLOSS

Rhetta Q. Davis, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 303,792, Sep. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 166,230, Jul. 7, 1980, abandoned. This application Aug. 23, 1982, Ser. No. 410,728
Int. Cl.[3] C08L *63/00*
U.S. Cl. 525—109 12 Claims

1. In a powder coating containing a solid curable epoxy resin containing more than one vicinal epoxy group and a curing agent therefor selected from the group consisting of (1) substituted guanidines, (2) derivatives of biguanides, (3) aliphatic amines, (4) aromatic amines, (5) compounds having an average of more than one phenolic hydroxyl group per molecule and which are free of (a) sulfone groups and (b) fused rings, (6) polycarboxylic acids, (7) halogenated anhydrides, (8) non-halogenated anhydrides, and (9) mixtures thereof; the improvement which comprises employing as at least a part of said curing agent, a polymer prepared only from ethylene and acrylic acid as monomers, said polymer having a melt index of from about 30 to about 40,825 in a sufficient quantity so as to lower the 60° gloss of the coating when cured.

4,419,496

PARTICLE AGGLOMERATION IN RUBBER LATICES

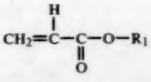
David E. Henton, and Teresa M. O'Brien, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1982, Ser. No. 350,849
Int. Cl.[3] C08F *279/02*
U.S. Cl. 525—301 25 Claims

1. An agglomerating agent (AgAg) suitable for agglomerating the particles of a latex of an elastomeric material which AgAg is a dispersion of particles having core material and shell material, said AgAg comprising:

(a) as shell material substantially grafted to the core material, from about 5 to about 50 weight percent, based on the total weight of the AgAg of a polymerized mixture of:

(i) from about 80 to about 99.5 weight percent based on the total weight of component (a) of ester monomer of the formula:



wherein R_1 is a lower alkyl radical containing up to about 4 carbon atoms; and

(ii) from about 0.5 to about 20 weight percent based on weight component (a) of an ethylenically unsaturated mono- or difunctional carboxylic acid having from about 3 to about 8 carbons;

(b) as core material, from about 50 to about 95 weight percent, based on the total weight of the AgAg, of an elastomeric material, such core material having polymerized therein essentially no ester monomer which is polymerized in the shell material.

4,419,497

PROCESS FOR PRODUCING NOVEL HYDROGENATED RESIN FROM FIVE-MEMBER CYCLIC COMPOUNDS HAVING A CONJUGATED DOUBLE BOND AND/OR DIELS-ALDER ADDITION PRODUCTS THEREOF

Shozo Tsuchiya, Tokyo; Akio Oshima, and Hideo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed May 17, 1982, Ser. No. 378,680
Claims priority, application Japan, Aug. 22, 1979, 54-106109; Aug. 23, 1979, 54-106606; Nov. 14, 1979, 54-146442; Jun. 6, 1980, 55-75453; Jun. 6, 1980, 55-75454
Int. Cl.[3] C08F *8/04*
U.S. Cl. 525—338 15 Claims

1. A process for producing a novel hydrogenated resin which comprises the steps of:

(i) copolymerizing a five-member cyclic compound (component A) selected from the group consisting of cyclopentadiene, dicyclopentadiene, and mixtures thereof, with a codimer (component B) of cyclopentadiene and 1,3-butadiene selected from the group consisting of tetrahydroindene, vinylnorbornene, and mixtures thereof, by heating a mixture of 20 to 90 parts by weight of said component A and 80 to 10 parts by weight of said component B at a temperature of from 220° to 350° C. to obtain a resin; and

(ii) hydrogenating said resin to hydrogenate substantially all the carbon-carbon double bonds in the resin.

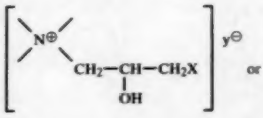
4,419,498

PROCESS FOR PRODUCING QUATERNARY AMMONIUM AMINO POLYAMIDE CONTAINING HALOHYDRIN FUNCTIONALITY

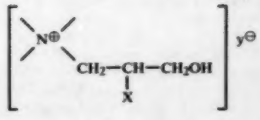
Ralph A. Bankert, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 155,026, May 30, 1980, Pat. No. 4,354,006. This application Aug. 12, 1982, Ser. No. 407,533
Int. Cl.[3] C08G *69/48*
U.S. Cl. 525—426 5 Claims

1. A process for producing a polymeric quaternary ammonium compound containing halohydrin functionality and having in its molecular structure at least one quaternary nitrogen group of the formula



or



where X and y are halogen, which process comprises reacting an aminopolyamide derived from a polyamine containing at least three amine groups, at least one of which is a tertiary amine group and a saturated aliphatic dicarboxylic acid said aminopolyamide containing at least one tertiary amine group,

with at least one mole of allyl halide per mole of tertiary amine present in the aminopolyamide to quaternize the tertiary amine groups and form allyl substituted quaternary ammonium halide groups, and then reacting the resulting allyl substituted product with hypohalous acid until substantially all of the allyl substituents are converted to the corresponding halohydrin moieties.

4,419,499

COMPOSITIONS OF URETHANE RUBBER AND NYLON

Aubert Y. Coran; Raman Patel, and Debra Williams, all of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 25, 1982, Ser. No. 361,703

Int. Cl.³ C08L *77/00*

U.S. Cl. 525—424 **20 Claims**

1. A composition comprising a blend of about 10–75 parts by weight of nylon, and, correspondingly, about 90–25 parts by weight of cured millable urethane rubber in which the curing agent consists essentially of an organic peroxide.

4,419,500

PROCESS FOR PRODUCING QUATERNARY AMMONIUM POLYAMINO UREYLENE CONTAINING HALOHYDRIN FUNCTIONALITY

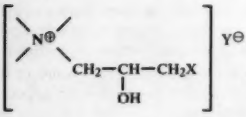
Ralph A. Bankert, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 155,026, May 30, 1980, Pat. No. 4,354,006. This application Jul. 29, 1982, Ser. No. 403,204

Int. Cl.³ C08G *71/02*

U.S. Cl. 525—540 **6 Claims**

1. A process for producing a quaternary ammonium compound containing halohydrin functionality and having in its molecular structure at least one quaternary nitrogen group of the formula



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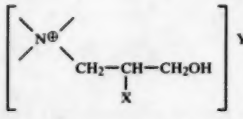


where X and y are halogen, which process comprises reacting a polyaminoureylene containing at least one tertiary amine group and derived by reacting urea with a polyamine containing at least three amine groups, at least one of which is a tertiary amine group, with at least one mole of allyl halide per mole of tertiary amine present in the polyaminoureylene to quaternize the tertiary amine groups and form allyl substituted quaternary ammonium halide groups, and then reacting the resulting allyl substituted product with hypohalous acid until substantially all of the allyl substituents are converted to the corresponding halohydrin moieties.

4,419,501

OLEFIN POLYMERIZATION CATALYST COMPONENTS AND POLYMERIZATION PROCESS

Brian L. Goodall, and Jacob C. Van Der Sar, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 207,848, Nov. 18, 1980, Pat. No. 4,343,721. This application Feb. 4, 1982, Ser. No. 345,900

Claims priority, application United Kingdom, Nov. 20, 1979, 7940131

Int. Cl.³ C08F *4/02, 10/00*

U.S. Cl. 526—122 **19 Claims**

1. Process for the polymerization of alpha-monoolefins which comprises contacting the monomer or monomers to be polymerized with a catalyst composition comprising

(a) an organoaluminum compound, and

(b) a titanium-containing catalyst component prepared by contacting a solid composition consisting essentially of magnesium dihalide, an electron donor and a tetravalent titanium halide, this composition being substantially free from aluminum compounds, with a dilute suspension or solution, in a substantially anhydrous liquid medium, of from 1 to 50 mol %, basis titanium, of a halide of B, Al, Ga, In, Tl, Sn or Sb, these elements being present in their highest valency state or a halide of tetravalent Te, and removing from the resulting solid substantially all metal halide originating from the liquid medium; and

recovering the resulting olefin polymer.

4,419,502

POLYMERIZATION PROCESS FOR CARBOXYL CONTAINING POLYMERS

Eugene J. Sehm, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 29, 1982, Ser. No. 427,323

Int. Cl.³ C08F *2/08*

U.S. Cl. 526—209 **10 Claims**

1. A method comprising polymerizing olefinically unsaturated carboxylic acids containing at least one activated carbon-to-carbon olefinic double bond and at least one carboxyl group in a polymerization media consisting essentially of methylene chloride in the presence of a free radical forming catalyst and a surface active agent having an HLB value greater than 12 selected from the group consisting of sorbitan polyoxyethylene(n)monoesters and polyoxy ethylene(n)alkyl ethers wherein n is a number from 18 to 28 and the acid radical of the ester and the alkyl group of the ether containing from 8 to 22 carbon atoms.

4,419,503

CATALYTIC PROCESS FOR THE PRODUCTION OF PETROLEUM RESINS

Francisco M. Benitez, and Michael F. English, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 24, 1982, Ser. No. 381,205

Int. Cl.³ C08F *4/14*

U.S. Cl. 526—237 **7 Claims**

1. A process for the polymerization of olefin and diolefin hydrocarbons into a petroleum resin comprising the step of contacting a feedstream of olefinic and diolefinic hydrocarbons of 5 to 12 carbon atoms having less than about 100 ppm water with an anhydrous hydrogen halide in a weight ratio of hydrogen halide to feedstream of 1:250 to 1:2000 and under substantially anhydrous conditions with a catalyst comprising a Friedel-Crafts metal halide selected from the group consisting of $AlCl_3$, $AlBr_3$ and BF_3, said hydrogen halide present in a molar ratio with said metal halide of from 0.5 to 2 and thereby causing the C_5–C_{10} olefinic and diolefinic hydrocarbons to form a petroleum resin.

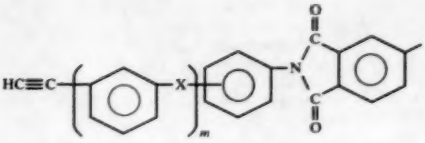
4,419,504

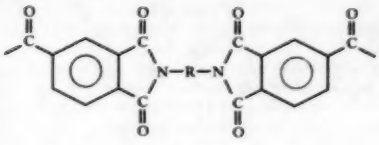
METHOD OF ACCELERATING CURE RATES FOR ACETYLENE-TERMINATED RESINS AND CURABLE COMPOSITIONS EMPLOYED THEREIN

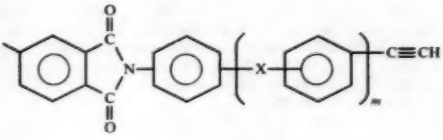
Harry T. Hanson, Millburn, N.J., assignor to Celanese Corporation, New York, N.Y.

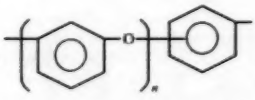
Filed Apr. 7, 1982, Ser. No. 366,445
Int. Cl.³ C08F *238/00*
U.S. Cl. 526—262 **8 Claims**

1. A method for accelerating the cure rate of a resin selected from the group consisting of ethynylated polyimide oligomers having the structure:

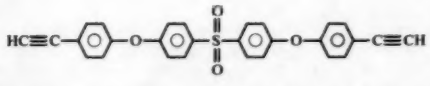




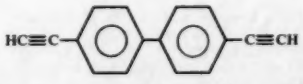


wherein R =  and

wherein n=0 to 5, m=0 to 5, and X is 0, S, CH_2, CO or SO_2; and ethynyl-terminated aromatic sulfones having the structure:



wherein at least some of the aromatic rings in said sulfones may optionally include substitution of at least some of the hydrogen atoms present thereon by a substituent selected from the group consisting of an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having from 1 to 4 carbon atoms, a halogen and mixtures thereof, said method comprising thermally curing said resin in combination with an amount of a diethynylbiphenyl effective to accelerate the cure of said resin having the following structure:



wherein at least some of the aromatic rings in said diethynylbiphenyl may optionally include substitution of at least some of the hydrogen atoms present thereon by a substituent selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms and mixtures thereof.

4,419,505

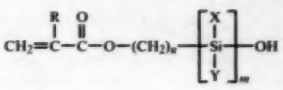
CONTACT LENS COMPOSITION, ARTICLE AND METHOD OF MANUFACTURE

Donald J. Ratkowski, Mesa, and Ping-Chang Lue, Scottsdale, both of Ariz., assignors to Paragon Optical, Inc., Mesa, Ariz.

Filed Jul. 14, 1982, Ser. No. 398,423
Int. Cl.³ C08F *30/08*
U.S. Cl. 526—279 **4 Claims**

1. A copolymer composition, specially adapted for use in fabricating a contact lens, comprising a copolymer of copolymerized comonomers including:

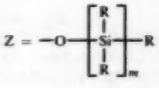
(a) about 1-95 parts by weight of a hydroxy ester silane of the structure



where

R=CH_3—, H—

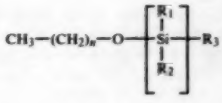
X, Y=C_1–C_6 Alkyl, phenyl, Z



n=1-3

m=1-5 and

(b) an alkyl-alkoxy silane of the structure



where

R_1, R_2 and R_3—C_1–C_6 Alkyl

n=an integer from 1-3,

said alkyl-alkoxy silane being present in an amount of 0 parts by weight to just below stoichiometric with respect to said hydroxy ester silane; and

(c) about 99-5 parts by weight of a C_1–C_{20} alkanol ester of acrylic or methacrylic acid.

4,419,506

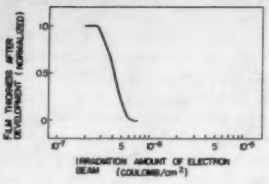
RADIATION SENSITIVE POLYMER MATERIALS

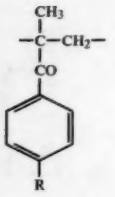
Kazuo Nate, Machida; Toshio Kobayashi, Tokyo, and Tokio Isogai, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,511
Claims priority, application Japan, Mar. 27, 1981, 56-44032
Int. Cl.³ C08F *116/36, 212/00, 216/36*
U.S. Cl. 526—316 **17 Claims**

1. A radiation sensitive polymer material for producing a positive type resist having improved radiation sensitivity which consists essentially of

(a) 10 to 100% by mole of one or more repeating units of the formula:





(I)

wherein R is a hydrogen atom, a lower alkyl group, a lower alkoxy group, a halogen atom, or a dialkylamino group, and

(b) 90 to 0% by mole of an addition polymerizable repeating unit derived from a compound having a $CH_2{=}C<$ group in the molecule.

4,419,507

COPOLYESTER ADHESIVES

Bobby J. Sublett, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 342,612, Jan. 25, 1982. This application Oct. 27, 1982, Ser. No. 437,060

Int. Cl.³ C08G *63/16;* **B32B** *27/00*

U.S. Cl. 528—302 **15 Claims**

1. A linear copolyester derived from 100 mole % of a dibasic acid component comprising about 40–100 mole % terephthalic acid and 100 mole % of a glycol component comprising about 40–100 mole % 1,4-butanediol, wherein about 20–120 mole %, based on a total of 200 mole % polymer, is derived from about

(a) 0–60 mole % of a second acid selected from the group consisting of aliphatic dicarboxylic acids having 3–12 carbon atoms,

(b) 0–60 mole % of diethylene glycol, or

(c) 20–120 mole % of a combination of said second acid and diethylene glycol,

said copolyester characterized by having a melting point of about 40°–190° C., a glass transition temperature of about −20° C. to about 40° C., a heat of fusion of not less than 1.0 calorie per gram, and a crystallization half time of less than 10 minutes at maximum crystallization temperature.

4,419,508

20-DIHYDRO-20-DEOXY-23-DEMYCINOSYLTYLOSIN AND PROCESS FOR ITS PRODUCTION

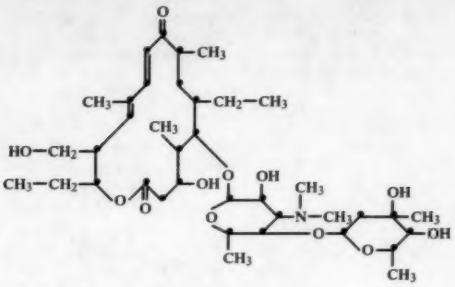
Richard H. Baltz; Herbert A. Kirst; Gene M. Wild, all of Indianapolis, Ind., and Eugene T. Seno, Norwich, England, assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 205,539, Nov. 10, 1980, Pat. No. 4,304,856. This application Sep. 28, 1981, Ser. No. 305,930

Int. Cl.³ C07H *17/08;* **C12P** *19/62*

U.S. Cl. 536—7.1 **33 Claims**

1. A compound selected from the group consisting of (1) 20-dihydro-20-deoxy-23-demycinosyltylosin which has the structure:



and (2) the acid addition salts of 20-dihydro-20-deoxy-23-demycinosyltylosin.

4,419,509

PROCESS FOR DE-CYANOETHYLATING BLOCKED NUCLEOTIDES

Hansen M. Hsiung, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 24, 1981, Ser. No. 295,421

Int. Cl.³ C07H *15/12, 17/00*

U.S. Cl. 536—27 **8 Claims**

1. A process for selectively removing a β-cyanoethyl blocking group from the phosphate moiety of a nucleotide or polynucleotide, which comprises treating said nucleotide or polynucleotide with a primary amine having from 3 to 5 carbon atoms.

4,419,510

METHOD FOR CONTROLLING CELLULOSE ETHERIFICATION REACTION

Timothy Thomson, and Ferman Peters, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 30, 1982, Ser. No. 403,898

Int. Cl.³ C08B *11/00, 11/02*

U.S. Cl. 536—84 **4 Claims**

1. A method for controlling the reaction for making cellulose ether compounds from cellulose and an etherifying agent comprising the steps of:

(a) combining cellulose with an alkylene oxide and alkyl halide in a reactor wherein an etherification reaction is initiated which includes a vapor phase,

(b) periodically measuring the quantity of at least one of the reactants or products in the vapor phase of the reactor and therewith determining the rate of the etherification reaction taking place, and

(c) regulating the reaction temperature continuously while the reaction is taking place by using the rate of reaction determined in step (b) to determine the amount of heating or cooling needed for the reactor.

4,419,511

PROCESS FOR THE PREPARATION OF TRIMETHINE DYESTUFFS

Roderich Raue, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Del.X

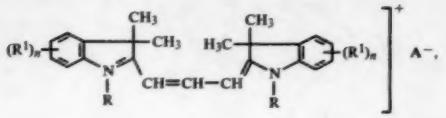
Filed Jan. 28, 1982, Ser. No. 344,262

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105778

Int. Cl.³ C09B *23/06*

U.S. Cl. 542—471 **5 Claims**

1. A process for the preparation of trimethine dyestuffs of the formula



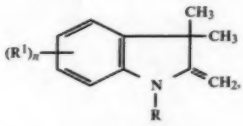
wherein

R represents a C_1- to C_4-alkyl radical,

R^1 represents hydrogen, C_1- to C_4-alkyl, benzyl, cyclohexyl, C_1- to C_4-alkoxy, benzyloxy, phenoxy, halogen, trifluoromethyl, acetylamino, carboxylic acid C_1- to C_4-alkyl esters, carbonamide which may be substituted by C_1- to C_4-alkyl and/or phenyl, C_1- to C_4-alkylsulphonyl, phenylsulphonyl, cyano, nitro, benzoxazol-2-yl, benzimidazol-2-yl, benzthiazol-2-yl or sulphonamide which may be monosubstituted or disubstituted by C_1- to C_4-alkyl, or two radicals R^1 represent a fused benzene ring,

n denotes 1 to 4 and

A^- denotes an anionic radical, and wherein the aliphatic and aromatic radicals can carry further nonionic radicals, characterised in that first an alkali metal salt of formic acid is reacted with a mixture of acetic acid and acetic anhydride and thereafter the product is reacted with indoline compounds of the formula



in which R, R^1 and n have the abovementioned meaning.

4,419,512

N-SUBSTITUTED POLYALKYLPIPERIDINE-4-SPIROOXAZOLONES

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,647

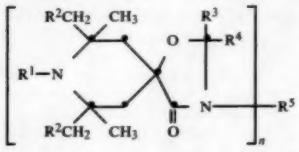
Claims priority, application Switzerland, Oct. 15, 1981, 6600/81

Int. Cl.³ C07D *498/10, 498/20*

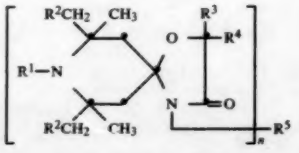
U.S. Cl. 544—70 **3 Claims**

1. A compound of the formula Ia or Ib

(Ia)



(Ib)

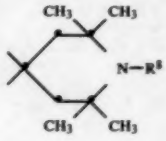


wherein

n is 1 or 2;

R^1 is C_2–C_{30}alkanoyl, C_3–C_{20}alkenoyl, $—CH_2CN$, —CO—$N(R^6)(R^7)$, C_7–C_{11}aroyl, C_8–C_{14}arylalkanoyl or C_8–C_{20}alkylaroyl;

R^2 is hydrogen or C_1–C_4alkyl; each of R^3 and R^4 independently of the other is hydrogen, C_1–C_{30}alkyl, unsubstituted or chlorine- or alkyl-substituted C_6–C_{10}aryl, unsubstituted or alkyl-substituted C_7–C_{11}aralkyl, or R^3 and R^4, together with the carbon atom to which they are attached, form a cycloalkane or alkylcycloalkane ring containing 5 to 18 carbon atoms, or a group of the formula



R^5, when n is 1, is C_1–C_{30}alkyl, C_3–C_{20}alkenyl, unsubstituted or alkyl-substituted C_7–C_{11}aralkyl, or is C_5–C_{12}cycloalkyl, C_2–C_{18}alkanoyl, C_3–C_{18}alkenoyl, C_7–C_{11}aroyl, C_8–C_{14}arylalkanoyl or C_8–C_{20}alkylaroyl, or

R^5, when n is 2, is C_2–C_{30}alkylene, C_2–C_{30}alkenylene or C_8–C_{18}arylenedialkylene;

R^6 is hydrogen, C_1–C_{18}alkyl, C_5–C_8cycloalkyl, C_7–C_{15}aralkyl or C_6–C_{10}aryl;

R^7 is C_1–C_{18}alkyl, C_5–C_8cycloalkyl, C_7–C_{15}aralkyl or C_6–C_{10}aryl; or

R^6 and R^7, together with the nitrogen atom, form a pyrrolidine, piperidine, morpholine or piperazine ring; and

R^8 is hydrogen, C_1–C_{12}alkyl, C_3–C_5alkenyl, C_3–C_5alkynyl, unsubstituted or alkyl-substituted C_7–C_{11}aralkyl, C_2–C_5alkanoyl, C_3–C_{18}alkenoyl, $—CH_2CN$ or —CO—$N(R^6)(R^7)$.

4,419,513

ISOCYANATO-ISOCYANURATES, AND PROCESS FOR THE PRODUCTION THEREOF

Peter Breidenbach, Cologne; Manfred Bock, Leverkusen; Josef Pedain, Cologne, and Gerhard Mennicken, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

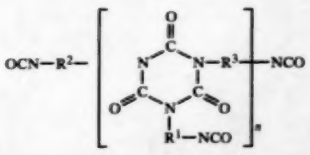
Filed Aug. 27, 1981, Ser. No. 296,677

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1980, 3033860

Int. Cl.³ C07D *251/34*

U.S. Cl. 544—222 **13 Claims**

1. Compounds or mixtures of compounds corresponding to the following general formula:



wherein

R^1, R^2 and R^3, which may be the same or different, represent a hexamethylene radical or a radical obtainable by removing the isocyanate groups from 1-isocyanato-3,3,5-trimethyl-5-isocyanatomethyl-cyclohexane, such that (on statistical average) at least about 20% and at the most about 80% of the radicals R^1, R^2 and R^3 represent a hexamethylene radical; and

n represents an integer, or based on statistical average, a fractional number of from about 1 to 7.

4,419,514

METHOD FOR CONVERTING CARBOXYLIC ACID GROUPS TO TRICHLOROMETHYL GROUPS

Lennon H. McKendry, Midland, Mich.; Michael J. Ricks, Martinez, and Richard B. Rogers, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 180,064, Aug. 21, 1980, abandoned. This application May 18, 1981, Ser. No. 264,491

Int. Cl.³ C07D *239/02, 211/72, 211/84, 213/26*

U.S. Cl. 544—334 **13 Claims**

1. A method for converting a carboxylic acid group on the ring of an aryl or nitrogen heteroaromatic compound to a trichloromethyl group which comprises contacting said aryl or nitrogen heteroaromatic compound with a phenylphosphonic dichloride and phosphorus pentachloride in a ratio of from about 0.01:1 to about 10:1 for a time and at a temperature sufficient to carry out the conversion of the carboxylic acid group to a trichloromethyl group.

4,419,515

TWO STAGE PROCESS FOR PREPARING 2,6-PYRIDINEDICARBOXYLIC ACID

Giovanni Ghelli, Savona; Enrico Bruschi, and Gino Agnese, both of Genoa, all of Italy, assignors to Luigi Stoppani S.p.A., Milan, Italy

Continuation of Ser. No. 167,222, Jul. 9, 1980, abandoned, which is a continuation of Ser. No. 965,037, Nov. 30, 1978, Pat. No. 4,237,301. This application Jul. 13, 1981, Ser. No. 283,082

Claims priority, application Italy, Dec. 1, 1977, 30273 A/77

Int. Cl.³ C07F *11/00;* **C07D** *213/55*

U.S. Cl. 546—5 **7 Claims**

1. An intermediate molar addition compound prepared by oxidation of 2,6-dimethyl-pyridine, the process comprising the step of reacting at a temperature of from about 70°–115° C. and at atmospheric pressure in a homogeneous phase an acid solution of 2,6-dimethyl-pyridine with a solution of a soluble salt of hexavalent chromium having a concentration based on CrO_3 to provide from about a 10–100% stiochiometric excess to form said addition compound in insoluble form, and recovering said addition compound.

4,419,516

ANTIVIRAL IMIDAZO- AND TRIAZOLO-PYRIDINES

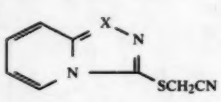
Peter H. L. Wei, Springfield, and Stanley C. Bell, Penn Valley, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,805

Int. Cl.³ C07D *471/04*

U.S. Cl. 546—119 **3 Claims**

1. A compound having the formula



wherein X is CH or N.

4,419,517

4A-ARYL-TRANS-DECAHYDROISOQUINOLINES

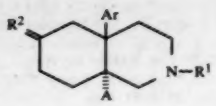
David R. Brittelli, Nottingham, Pa., and William C. Ripka, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 365,843, Jun. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 273,806, Jul. 20, 1972, abandoned. This application Apr. 8, 1975, Ser. No. 566,089

Int. Cl.³ C07D *217/14*

U.S. Cl. 546—144 **22 Claims**

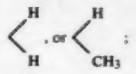
1. A compound of the formula



wherein

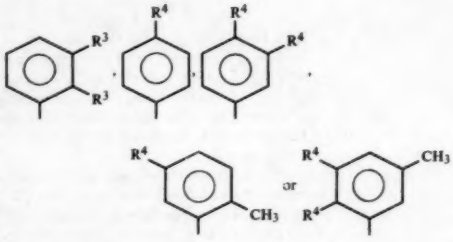
R^1 is C_1–C_6 alkyl or cycloalkylmethyl of the formula $—CH_2OH<(CH_2)_n$ in which n is an integer in the range 2–5;

R^2 is



A is hydrogen or hydroxyl;

Ar is



in which

R^3 is hydrogen, hydroxyl, methoxyl or acetoxyl;

R^4 is hydroxyl, methoxyl or acetoxyl; and jointly, two of R^3 or of R^4 situated on adjacent carbons may be combined to form a divalent methylenedioxy ($—OCH_2O—$) group; provided that when R^1=methyl, R^3 may not both be hydrogen.

4,419,518

1,4-DIHYDROPYRIDINE DERIVATIVES

Masato Kamibayashi, Hasuda; Shinji Tsuchiya, Washimiya, and Kozo Hiratsuka, Tsurugashima, all of Japan, assignors to Tokyo Tanabe Co. L.T.D., Japan

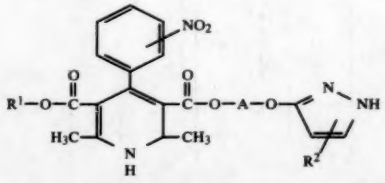
Filed Jul. 26, 1982, Ser. No. 402,124

Int. Cl.³ C07D *401/12*

U.S. Cl. 546—279 **11 Claims**

1. A 1,4-dihydropyridine derivative of the following general formula [I]:

[I]



wherein R^1 represents an alkyl group having from 1 to 4 carbon atoms or an alkoxyalkyl group having from 3 to 6 carbon atoms, R^2 represents an alkyl group having from 1 to 8 carbon atoms, and A represents a hexamethylene group which may optionally be substituted by one or two alkyl groups having from 1 to 3 carbon atoms.

4,419,519

CONTINUOUS PREPARATION OF PHTHALIMIDE

Gerhard Kilpper, Battenberg, and Johannes Grimmer, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 119,958, Feb. 8, 1980. This application Jun. 29, 1981, Ser. No. 278,697

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911245

Int. Cl.³ C07D *209/48*

U.S. Cl. 548—480 11 Claims

1. A concurrent, two stage process for the continuous preparation of phthalimide wherein phthalic anhydride and ammonia are reacted in stoichiometric ratios, which comprises:

(a) turbulently mixing phthalic anhydride and ammonia, in the ratios of 1.0 to 1.1 miles of ammonia per mole of phthalic anhydride, in turbulent mixing apparatus, wherein the degree of mixing is at least equivalent to that achieved by continuously passing both molten phthalic anhydride at a flow velocity of from 0.005 to 15 meters per second and ammonia at a flow velocity of from 0.1 to 50 meters per second into ejector mixers, the temperature in said mixing apparatus being from 135° to 300° C., the pressure within said mixing apparatus being from 1 to 50 bar, the ratio of ammonia to phthalic anhydride being 1 to 1.1 mole of ammonia per mole of phthalic anhydride, said phthalic anhydride and ammonia being both thoroughly mixed in said apparatus and reacted to the extent that from about 50 to 80% by weight of the phthalic anhydride is reacted within the mixing apparatus; and thereafter

(b) passing the reaction mixture from the mixing apparatus into and through a reaction tube at a flow velocity of from 0.01 to 100 meters per second, the temperature within said reaction tube being from 235° to 300° C. and the pressure within said reaction tube being from 1 to 50 bar, the reaction between the phthalic anhydride and the ammonia being completed within the reaction tube in a residence time of 0.1 to 600 seconds.

4,419,520

HYDROXYALKYL- AND ALKOXYALKYL-TRIAZOLIDINE-3,5-DIONE COMPOUNDS AND THEIR PROCESSES FOR THEIR PREPARATION

Ludwig Rottmaier, Odenthal, and Ruldolf Merten, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

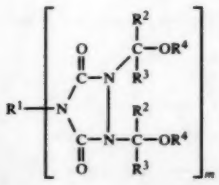
Filed Jun. 29, 1981, Ser. No. 278,369

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027596

Int. Cl.³ C07D *249/12*

U.S. Cl. 548—264 20 Claims

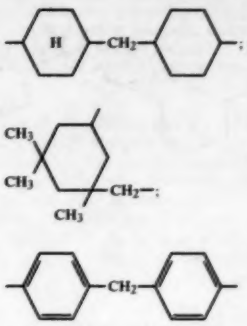
1. A compound of the formula



wherein

m is an integer of from 1 to 5;

R^1 is an aliphatic group having 1 to 20 carbon atoms; a mono- or poly-cycloaliphatic group having from 5 to 21 carbon atoms; an araliphatic group having 7 to 17 carbon atoms; an aromatic group having 6 to 20 carbon atoms; one of the aforesaid groups substituted by halogen, C_1–C_{10}-alkoxy or C_1–C_{10}-alkoxycarbonyl;



or, in the case where m is 1, R^1 can also be

R^2 and R^3, independently of each other, are each hydrogen or an aliphatic group having 1 to 10 carbon atoms, and

R^4 is hydrogen, an aliphatic group having 1 to 20 carbon atoms or a mono- or polycycloaliphatic group having 5 to 10 carbon atoms or an araliphatic group having 7 to 17 carbon atoms.

4,419,521

6-HALO-4-CHROMANAMINES USEFUL AS INTERMEDIATES TO MAKE CHIRAL HYDANTOINS

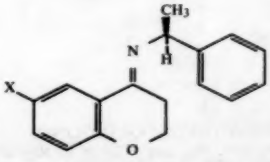
Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

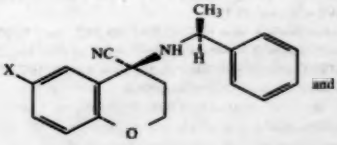
Division of Ser. No. 320,051, Nov. 12, 1981, Pat. No. 4,348,576, which is a continuation-in-part of Ser. No. 226,434, Jan. 19, 1981, abandoned, which is a division of Ser. No. 135,137, Mar. 28, 1980, Pat. No. 4,286,098. This application Jun. 17, 1982, Ser. No. 389,253

Int. Cl.³ C07D *311/02*

U.S. Cl. 549—404 10 Claims

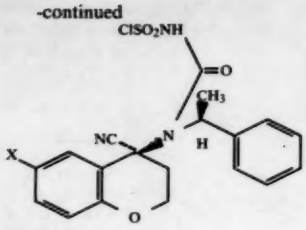
1. A compound selected from the formula





and

-continued



wherein X is chloro or fluoro.

4,419,522

HEXITOLS CONTAINING FREE CARBOXY GROUPS AND A PROCESS FOR THE PREPARATION THEREOF

Ilona Elekes; Laszlo Institoris; Kalman Medzihradszky; Laszlo Ötvös; Hedvig Medzihradszky-Schweiger; Katalin De Gleria; Janos Sugar; Somfai Relle; Sandor Eckhardt; Ivan Hidy, and Sandor Kerpel-Fronius, all of Budapest, Hungary, assignors to Chinoin Gyogyszer Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

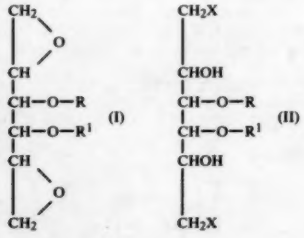
Filed Oct. 26, 1981, Ser. No. 315,182

Claims priority, application Hungary, Nov. 4, 1980, 2649/80

Int. Cl.[3] **C07D** *303/16;* **C07C** *69/657, 69/653, 69/65, 69/635, 69/63;* **A61K** *31/335*

U.S. Cl. 549—557 **11 Claims**

1. A hexitol of the formula (I) or (II),



wherein

the hexitol skeleton is dulcitol, mannitol or iditol,

X represents halogen,

R is a saturated or unsaturated C_{4-10} alkylcarbonyl group which also contains a free carboxy group, and

R^1 is hydrogen, a saturated or unsaturated C_{4-10} alkylcarbonyl group which also contains a free carboxy group, a saturated or unsaturated C_{2-10} alkylcarbonyl group, a saturated or unsaturated C_{4-10} alkylcarbonyl group which also contains an alkoxycarbonyl group, or a saturated or unsaturated C_{8-10} aralkylcarbonyl group,

or a pharmaceutically acceptable salt thereof.

4,419,523

N-(BENZENESULFONYL) CARBAMATES-HERBICIDAL ANTIDOTES

Ferenc M. Pallos, Walnut Creek, and Edmund J. Gaughan, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

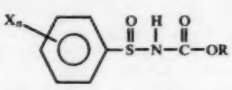
Division of Ser. No. 108,889, Dec. 31, 1979, Pat. No. 4,293,701, which is a division of Ser. No. 721,721, Sep. 13, 1976, Pat. No. 4,230,874, which is a continuation-in-part of Ser. No. 619,114, Oct. 2, 1975, abandoned. This application May 11, 1981, Ser. No. 262,576

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.[3] **C07C** *147/14*

U.S. Cl. 560—12 **5 Claims**

1. Compounds according to the formula



in which X is hydrogen, bromo, chloro, methoxy, trifluoromethyl, and methyl; n is an integer from 1 to 3 inclusive, provided that when X is bromo, trifluoromethyl, or methoxy, n is 1; and R is selected from haloalkyl having 2 to 6 carbon atoms, inclusive, wherein halo is chloro or fluoro from 1 to 6, inclusive, and dialkylamino having a total of 2 to 8 carbon atoms, inclusive, provided that when X is trifluoromethyl and n is 1, then R can be alkyl having 1 to 4 carbon atoms, inclusive.

4,419,524

PROCESS FOR THE PREPARATION OF DIHALOVINYLCYCLOPROPANECARBOXYLIC ACIDS

Ferenc Lindwurm; Jozsef Muskovits; Sandor Zoltan; Rezso Kolta; Rudolf Soos; Tivadar Puskas; Eva Somfai, and György Hidasi, all of Budapest, Hungary, assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt, Budapest, Hungary

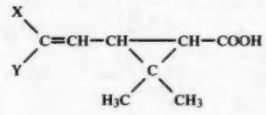
Filed Feb. 19, 1982, Ser. No. 350,424

Claims priority, application Hungary, Feb. 20, 1981, 411

Int. Cl.[3] **C07C** *69/743*

U.S. Cl. 562—506 **10 Claims**

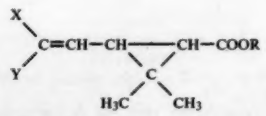
1. A process for the preparation of a carboxylic acid of the formula (I) having a given ratio of cis to trans isomers thereof



wherein

X and Y independently stand for halogen, which comprises the steps of:

(a) hydrolyzing a corresponding ester of the formula (II) having the same given ratio of cis to trans isomers thereof



wherein

R is alkyl having 1 to 6 carbon atoms, with a 2 to 50% by weight aqueous solution of an alkali metalhydroxide,

said alkali metal hydroxide present in an equivalent amount of 100% to 150% relative to the amount of the ester of the formula (II) present, in the presence of an alkali-resistant compound selected from the group consisting of sodium dodecyl benzenesulfonate, tricaprylmethyl ammonium chloride, cetyl trimethyl ammonium bromide, and polyoxyethylene sorbitane monooleate, the concentration of said compound amounting to 0.01 to 5% of the reaction mixture;

(b) adding an aliphatic hydrocarbon having 5 to 10 carbon atoms to the reaction mixture containing the hydrolysis product of step (a);

(c) adjusting the pH of the reaction mixture to an acidic pH by addition of an acid thereto; and

(d) separating the free carboxylic acid of the formula (I) from the aliphatic hydrocarbon containing 5 to 10 carbon atoms.

4,419,525
RECOVERY AND REJUVENATION OF WACKER-TYPE CATALYSTS

Tod K. Shioyama, and Jim J. Straw, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1982, Ser. No. 357,101

Int. Cl.³ C07C *45/27, 45/34;* B01J *31/40, 23/96*

U.S. Cl. 568—401 **5 Claims**

1. A process for the recovery and rejuvenation for reuse of a catalyst useful for the oxidation of olefins to ketones which catalyst contains a palladium component, a heteropolyacid component, and a surfactant component following its use to catalyze the oxidation of an olefin to a ketone in a reaction zone to produce a reaction mixture which contains an organic phase and an aqueous phase, which process includes the essential steps of:

(1) removing the organic phase from the reaction mixture to leave the aqueous phase,

(2) removing water from the aqueous phase until substantially dry catalyst solids remain,

(3) adding water to the product of step (2) to yield a solution, and

(4) recycling the solution of step (3) to the reaction zone.

2. The process of claim 1 which includes the step of (5) adjusting the pH of the solution from step (4) to a pH of about 0.5 to 3.0 before it is recycled to the reaction zone.

3. The process of any one of claims 1 or 2 wherein the catalyst also contains one or more boric acid components.

4,419,526
CATALYST AND REVERSE DISPROPORTIONATION PROCESS

Charles F. Hobbs, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 29, 1982, Ser. No. 403,254

Int. Cl.³ C07C *5/09, 15/40*

U.S. Cl. 585—435 **13 Claims**

1. A process for the reverse disproportionation of stilbene and ethylene which comprises contacting stilbene and ethylene at reverse disproportionation conditions with an activated catalyst containing catalytically-effective amounts of antimony, tungsten, and an alkali or alkaline earth component or compounds thereof supported on a carrier material to produce styrene.

4,419,527
CATALYST AND REVERSE DISPROPORTIONATION PROCESS

Charles F. Hobbs, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 29, 1982, Ser. No. 403,258

Int. Cl.³ C07C *5/09, 15/40*

U.S. Cl. 585—435 **13 Claims**

1. A process for the reverse disproportionation of stilbene and ethylene which comprises contacting stilbene and ethylene at reverse disproportionation conditions with an activated catalyst containing catalytically-effective amounts of lead, tungsten, and an alkali or alkaline earth component or compounds thereof supported on a carrier material, to produce styrene.

4,419,528
REGIOSELECTIVE PREPARATION OF α- OR β-NAPHTHOL

George A. Olah, Beverly Hills, Calif., assignor to PCUK - Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Oct. 5, 1979, Ser. No. 82,152

Int. Cl.³ C07C *37/60*

U.S. Cl. 568—741 **8 Claims**

1. A process for the regioselective hydroxylation of naphthalene with hydrogen peroxide giving either α- or β-naphthol in high isomeric purity between about 92 and 98+% depending on the acid system employed to carry out the reaction which comprises reacting naphthalene with a molar excess of hydrogen peroxide in an acid system having an H_o acidity function of −11 or less to produce α-naphthol with an isomeric purity between about 92 and 98+% or in a superacidic system having an H_o acidity function in excess of −11 to produce β-naphthol with an isomeric purity between about 92 and 98+%.

4,419,529
PROCESS FOR THE PREPARATION OF A 2-ALKYLPHENOL

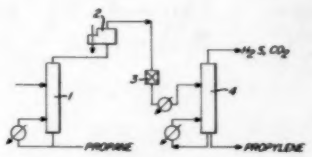
Arthur Steinmetz, Seelze, Fed. Rep. of Germany, assignor to Riedel-de Haen Aktiengesellschaft, Seelze, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,308

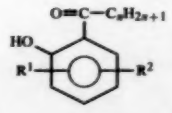
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108265

Int. Cl.³ C07C *37/00, 39/06*

U.S. Cl. 568—772 **15 Claims**



1. A process for the preparation of a 2-alkylphenol by reduction of a 2-acylphenol in the presence of a metallic catalyst, which comprises hydrogenating 2-acylphenol of the formula



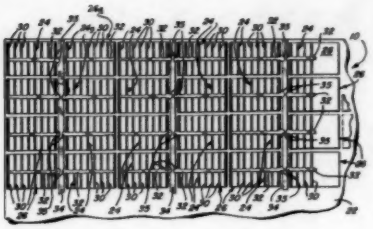
in which n represents an integer from 2 to 17 and R^1 and R^2 are identical or different and each denote a hydrogen atom, a halogen atom, a hydroxyl group, an alkoxy group having 1 to 16 carbon atoms, an acyl or acyloxy group each having 2 to 10 carbon atoms, a dialkylamino group having a total of 2 to 14 carbon atoms or a hydrocarbon radical having 1 to 16 carbon atoms, at a temperature of 80° to 200° C. and in the presence of gaseous hydrogen under a pressure of 10 to 100 bars and in the presence of a catalytically effective amount of a base metal selected from the group consisting of copper, nickel and cobalt.

ELECTRICAL

4,419,530
SOLAR CELL AND METHOD FOR PRODUCING SAME

Prem Nath, Troy, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Feb. 11, 1982, Ser. No. 347,779
Int. Cl.³ H01L *31/06, 25/02, 31/18*
U.S. Cl. 136—251 24 Claims



1. A method of fabricating improved photovoltaic devices, each photovoltaic device including: (a) a common electrically conductive substrate layer; (b) a semiconductor body deposited upon the substrate layer; and (c) a transparent, electrically conductive layer deposited atop the semiconductor body; the method including the steps of:

dividing the semiconductor body into a plurality of portions, each portion being substantially electrically isolated from other portions;

testing the electrial output of each isolated portion of the semiconductor body;

connecting only those electrically operative isolated portions to an electrically conductive strip; the conductive strip providing an electrical contact associated with the semiconductor body; and

providing an electrical contact on the substrate layer; whereby the overall efficiency of the photovoltaic device is improved by electrically connecting only those electrically operative portions of the semiconductor body.

14. An improved solar cell including: (a) a common electrically conductive substrate layer; (b) a semiconductor body deposited upon the substrate layer; and (c) a transparent electrically conductive layer deposited atop the semiconductor body; the solar cell comprising, in combination:

a plurality of substantially electrically isolated small area portions into which the semiconductor body is divided, at least one small area portion being electrically inoperative;

at least one electrically conductive strip;

only electrically operative portions of the semiconductor body electrically connected to the at least one conductive strip, the at least one conductive strip providing an electrical contact associated with the semiconductor body;

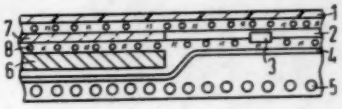
an electrical contact on the substrate layer; and

an upper, electrically-insulating, light-admitting, protective layer and a lower electrically-insulating layer, the solar cells encapsulated between the upper and lower layers, so that only electrically operative portions of the semiconductor body are electrically connected, thereby improving the overall efficiency of the solar cell.

4,419,531
PHOTO-VOLTAIC SOLAR MODULE

Josef Lang, Regensburg; Reinhard Hollaus, Obertraubling; Ulrike Reeh, Munich; Hans Denk, Gauting, and Reiner Habrich, Heimstetten, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,144
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3129167; Oct. 23, 1981, 3142129
Int. Cl.³ H01L *31/02*
U.S. Cl. 136—251 18 Claims

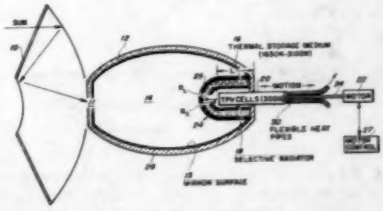


1. A solar module having at least one solar cell embedded in synthetic resin and resting on a flexible supporting element, further comprising a sheet-like rigid element reinforcing the solar cell.

4,419,532
THERMOPHOTOVOLTAIC POWER SOURCE

James G. Severns, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 30, 1982, Ser. No. 403,838
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—253 15 Claims



1. A thermophotovoltaic power source comprising:

a light energy concentrator for collecting light energy and concentrating it in a small area,

a thermal storage vessel including

a thermal storage material;

a containment vessel for holding said thermal storage material therein, said containment vessel being disposed within a portion of said thermal vessel,

a light aperture for introducing light energy from said concentrator into said thermal vessel so that it impinges on said containment vessel;

a hot selective band radiating layer disposed on a portion of the surface of said containment vessel for radiating in a small predetermined wavelength band when heated by said thermal storage material; and

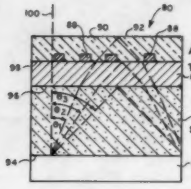
an array of photovoltaic cells positioned so that it may be disposed adjacent said selective radiating layer, said cells having a maximum spectral response approximating the predetermined wavelength band of said selective radiating layer; and

means for moving said photovoltaic array into and out of adjacency with said selective radiating layer.

4,419,533
PHOTOVOLTAIC DEVICE HAVING INCIDENT RADIATION DIRECTING MEANS FOR TOTAL INTERNAL REFLECTION

Wolodymyr Czubatyj, Hamtramck; Rajendra Singh, Clawson; Joachim Doehler, Union Lake; David D. Allred, Troy, and Jaime M. Reyes, Birmingham, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 3, 1982, Ser. No. 354,285
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—259 **19 Claims**

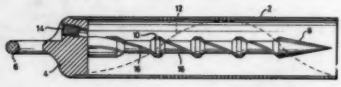


1. In a photovoltaic device formed from semiconductor material including at least one active region upon which incident radiation can impinge to produce charge carriers, the improvement comprising a random bulk reflector for directing at least a portion of said incident radiation through said at least one active region at an angle sufficient to cause said directed radiation to be substantially confined within said photovoltaic device.

4,419,534
END CAP FOR COMMUNICATIONS CABLES

Liam D. Dwyer, Corinth, Miss., assignor to American Sawmill Machinery Company, Corinth, Miss.

Filed Nov. 30, 1982, Ser. No. 445,662
Int. Cl.³ H02G *1/08, 15.23*
U.S. Cl. 174—10 **9 Claims**



1. An end cap for communication cables having multiple conductors comprising a cylindrical sleeve open at one end and dimensioned to receive an end of the cable, the sleeve being circumferentially crimpable to constrict the cable and form a gas tight seal therewith, a closure at the other end of the sleeve, a spigot extending axially within the sleeve from the closure and provided with at least one portion intermediate its length which is of enlarged cross section relative to the axially adjacent portions, and means in the end closure for introducing pressurized gas into the sleeve, wherein at least one continuous passageway for gas, extending substantially the length of the spigot and protected from obstruction by conductors of the cable, is formed in at least one longitudinally extending channel defined in the surface of the spigot.

4,419,535
MULTI-CABLE CONDUIT FOR FLOORS AND WALLS

Robert J. O'Hara, 2809 Covert Rd., Glenview, Ill. 60025

Filed Jul. 31, 1981, Ser. No. 288,767
Int. Cl.³ H02G *3/22*
U.S. Cl. 174—48 **27 Claims**

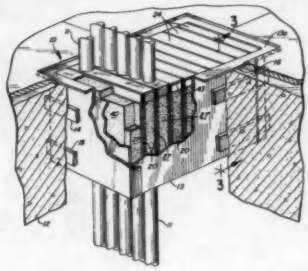
1. A multi-cable conduit comprising

a housing having openings at opposite ends thereof,

a plurality of partitions dividing the interior of said housing into a plurality of compartments extending between said openings and communicating therewith, each of said compartments being sized to receive a multiplicity of cables extending through the compartment and the open ends of the housing, said compartments also being elongated in a direction transverse to the axes of said cables,

means for supporting said partitions within said housing,

a lining of intumescent material on the walls of each of said compartments for expanding into and sealing each of said compartments in response to a fire,



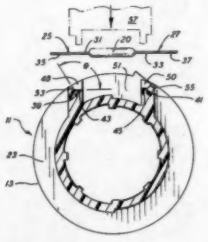
a non-flammable insert for filling any of said compartments, or portions thereof, that are not filled with cables, and

sealing means forming a seal between the walls of each compartment and any cables therein, said sealing means beng located at at least one of the open ends of each compartment, to limit the transmission of smoke through said compartments prior to expansion of said intumescent material.

4,419,536
MEANS FOR AFFIXING AN ELECTRONIC COMPONENT ON A SUPPORTING MEDIUM

Richard F. Doyle, Corfu; Thomas E. Gausman, Batavia, and Edward T. Myers, Tonawanda, all of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Continuation of Ser. No. 87,356, Oct. 23, 1979, abandoned. This application Mar. 30, 1982, Ser. No. 363,368
Int. Cl.³ H01F *27/40*
U.S. Cl. 174—52 R **5 Claims**



1. A supporting medium for receiving an electronic component having a body portion and a pair of substantially opposed leads extending outward from the body portion in a substantially axial manner, each of said leads having a proximal portion and a distal portion relative to the body portion, said supporting medium comprising

a bobbin of non-conductive material having a generally circular disc-like configuration, and having a peripheral portion for receiving an electronic component,

slot means formed in the peripheral portion of the bobbin, said slot means including a pair of sidewalls disposed generally co-planar with the bobbin, each sidewall having

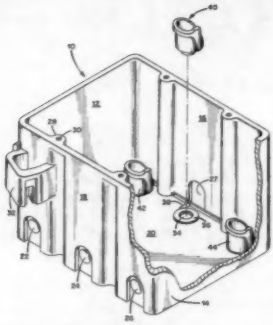
a bottom portion and an extremital end wall abutting the bottom portion, to form an obtuse angle therewith, said slot means further including a linear separation area between the pair of sidewalls, configured to receive the body portion of an electronic component.

4,419,537

ELECTRICAL WIRING BOX ARRANGEMENTS

Oral F. Leep, Vienna; Vernon D. Dellinger, Parkersburg, both of W. Va., and Claude J. Bauer, Belpre, Ohio, assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 17, 1982, Ser. No. 359,346
Int. Cl.³ H02G 3/08
U.S. Cl. 174—65 R **11 Claims**



1. An electrical wiring box arrangement including a wiring box and cable clamp device;

said wiring box comprising:

a wall structure defining front-to-rear walls and a rear wall therebetween which in combination define a chamber having a forward facing opening;

said wall structure including a first wall provided with a frangible knockout region for providing a knockout opening adapted to receive a non-metallic sheathed cable, and a second wall forming an angle with said first wall, said second wall provided with attachment receiving means for rotatably mounting said cable clamp device to said second wall adjacent to said knockout region in said first wall;

said cable clamp device comprising:

a generally cylindrical member having a base portion provided with attachment means for coacting with said attachment receiving means of said wiring box wall structure to rotatably mount said cable clamp member to said box wall structure;

a cable engaging surface; and

means for urging, generally in a direction along the axis of said cylindrical member, said cable engaging surface against an electrical cable inserted through said knockout opening in said wiring box wall structure;

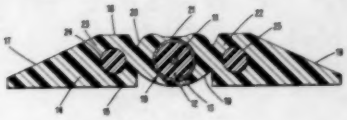
whereby a non-metallic sheathed electrical cable passing through said knockout opening of said wiring box having said cable clamp device attached thereto passes between the edge of the wall structure defining said knockout opening and the cable engaging surface of said clamp member, and upon rotation of said clamp member is urged against said edge, securing said cable.

4,419,538

UNDER-CARPET COAXIAL CABLE

George A. Hansell, III, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Nov. 13, 1981, Ser. No. 321,104
Int. Cl.³ H01B 7/08
U.S. Cl. 174—117 F **9 Claims**



1. A thin, flat electrical cable of the type having opposing generally flattened surfaces, the cable comprising:

(a) at least one elongated signal conductor;

(b) at least two elongated stress-bearing members longitudinally disposed parallel to, spaced apart from, and on opposite sides of, said signal conductor, said two members for bearing stresses resulting from a compressive load applied against the cable opposing surfaces; and

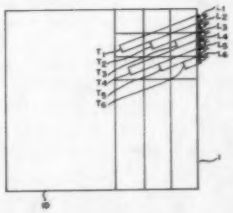
(c) a unitary, electrically insulative, pliable jacket means for fixing the transverse relationship of said signal conductor and said stress-bearing members, said means also for affording independent longitudinal movement to said stress-bearing members relative to said jacket means, said jacket means separately enclosing said signal conductor and said stress-bearing members.

4,419,539

APPARATUS FOR PREVENTING NOISE GENERATION IN AN ELECTRICAL DIGITIZER DUE TO GENERATION OF OPTICAL SIGNALS

David M. Arrigoni, Los Gatos, Calif., assignor to Arrigoni Computer Graphics, Los Gatos, Calif.

Filed Oct. 24, 1980, Ser. No. 200,310
Int. Cl.³ G08C 21/00; G02B 5/14
U.S. Cl. 178—18 **12 Claims**



1. In a digitizer having a menu section for selection of desired functions by a switch stylus/cursor at various locations in said section, an optical transmission means comprising

a solid light pipe capable of transmitting light having a first end and a second end, including

means situate outside said digitizer for emitting an optical signal into said first end;

said light pipe including said second end extending within the menu section of said digitizer;

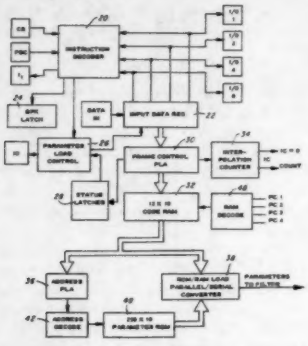
means for reflecting said optical signal at said second end; and

an emission region located on an exterior surface of said light pipe, wherein said optical signal reflected from said means for reflecting is transmitted through said emission region from the interior of said light pipe to illuminate a particular location on said menu section.

4,419,540
SPEECH SYNTHESIS SYSTEM WITH VARIABLE INTERPOLATION CAPABILITY

Alva E. Henderson, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 118,139, Feb. 4, 1980, Pat. No. 4,328,395.
This application Oct. 5, 1981, Ser. No. 308,293
The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—51 **7 Claims**



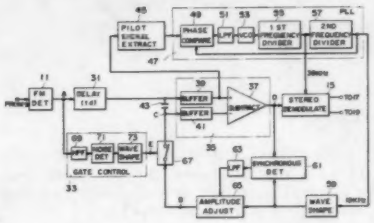
1. A speech synthesis system comprising:
input means for receiving frames of data, said frames of data comprising speech data and interpolation data;
digital storage means for storing scale data;
address means coupled to said input means and said digital storage means for selectively addressing specific scale data in response to said interpolation data;
interpolation means coupled to said input means and said digital storage means for interpolating between adjacent frames of said speech data based upon said specific scale data;
synthesizer means coupled to said input means and to said interpolation means for selectively converting said speech data into signals representative of human speech; and
means coupled to said synthesizer means for producing audible sound.

4,419,541
PULSIVE NOISE REMOVING APPARATUS

Hiroyasu Kishi, Gunma; Junji Sakamoto, and Sadao Kondou, both of Oota, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Filed Dec. 11, 1981, Ser. No. 329,726
Claims priority, application Japan, Jan. 20, 1981, 56/7465
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—7 **9 Claims**

1. A pulsive noise removing apparatus, comprising:
composite signal providing means for providing a composite signal including an information signal and a reference signal,
subtracting circuit means having two inputs and receiving said composite signal at one input thereto,
electric charge storing means coupled between said two inputs of said subtracting circuit means,
cancel signal generating means for generating a cancel signal for cancelling said reference signal upon application of said cancel signal to the other input of said subtracting circuit means,
noise detecting means for detecting a pulsive noise included in said composite signal, and
gate means interposed between said cancel signal generating means and said other input of said subtracting circuit means for being rendered conductive or interrupted responsive to said noise detecting means, whereby said gate means is interrupted upon detection of a pulsive noise for

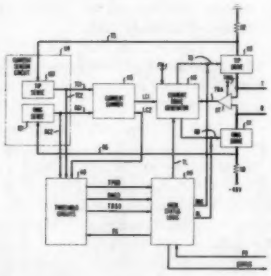


removing said pulsive noise and said information signal with said reference signal removed is obtained from said subtracting circuit means irrespective of conduction or interruption of said gate means.

4,419,542
BATTERY FEED CIRCUIT

Milton L. Embree, Reading, Pa.; Dieter J. H. Knollman, Arvada, Colo., and Earl O. Martin, Temple, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 17, 1982, Ser. No. 378,517
Int. Cl.³ H04M *19/08*
U.S. Cl. 179—77 **37 Claims**

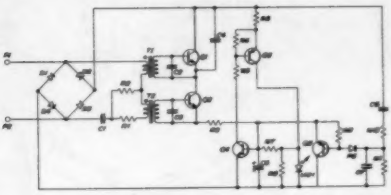


1. A battery feed circuit for a communication pair having first (R) and second (T) leads comprising:
first (**111**) and second (**113**) controlled current sources respectively connected to said first (R) and said second (T) lead of said communication pair and responsive respectively to a first (RD) and a second (TD) control signal for supplying a predetermined current to the associated lead (R, T) of said communication pair; and
wherein said battery feed circuit is
characterized by:
control means (**114–121**) connected to both said first (R) and said second (T) leads of said communication pair and responsive to both a common mode voltage (TRA) appearing on said communication pair and the current in said first (R) and said second (T) leads of said communication pair for generating said first (RD) and said second (TD) control signals, wherein said control means (**114–121**) are effective to maintain longitudinal balance on said first (R) and said second (T) leads of said communication pair.

4,419,543
TONE ACTIVATED HOLD CIRCUIT

Edward C. Kelm, 1136 Wellington, Pasadena, Calif. 91103, and Stephen Kurtin, 3835 Kingswood Rd., Sherman Oaks, Calif. 91403

Filed May 20, 1982, Ser. No. 380,038
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—81 R **17 Claims**



1. A telephone line hold circuit for a tone actuated dialing telephone system powered entirely from the telephone line which comprises:

a bistable load circuit coupled across a telephone line, said bistable load circuit having an ON state whereby current from said telephone line will flow through said bistable load circuit, and an OFF state whereby substantially no current will flow through said bistable load circuit;

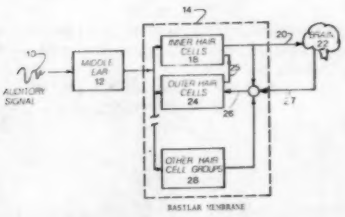
means responsive to and powered by a signal corresponding to a selected dialing tone of said telephone system for turning said bistable load circuit ON; and

reset means responsive to an increase in load across said telephone line for turning said bistable load circuit OFF.

4,419,544
SIGNAL PROCESSING APPARATUS

Roger A. Adelman, Cincinnati, Ohio

Filed Apr. 26, 1982, Ser. No. 371,584
Int. Cl.³ H04R *25/00*
U.S. Cl. 179—107 FD **7 Claims**



1. A signal processing apparatus for modifying acoustic patterns, comprising:

(a) means for receiving an acoustic signal and generating a processed signal in response thereto, said generated processed signal being representative of the acoustic signal;

(b) adaptive noise cancelling means associated with said receiving and generating means for suppressing portions of said generated signal which do not exceed a predetermined pattern recognition function, and producing an output signal characteristic thereof;

(c) frequency band separating means for dividing said generated signal into at least two separated signals in accordance to frequency;

(d) means for selectively transposing the frequency of at least one of said separated signals separated by said frequency band separating means;

(e) means for providing temporal matching of said separated signal;

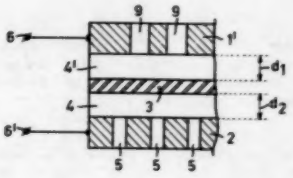
(f) means for summing the temporally matched signals into a resultant signal; and

(g) means for converting said amplified signal into an acoustic signal.

4,419,545
ELECTRET TRANSDUCER

Pieter I. Kuindersma, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 13, 1981, Ser. No. 282,620
Claims priority, application Netherlands, Jul. 30, 1980, 8004351
Int. Cl.³ H04R *19/00, 1/28*
U.S. Cl. 179—111 E **8 Claims**



1. An electret transducer comprising: a diaphragm, first and second electrodes disposed one on each side of the diaphragm with at least one electrode being spaced from the diaphragm as a stationary electrode so as to form a first air gap between the diaphragm and said stationary electrode, said stationary electrode being formed with holes which are substantially uniformly distributed over its surface area, and wherein an acoustic impedance Z acting on the diaphragm is determined by means of the formula

$$Z = 6\eta \sum_{i=1}^{n} \frac{A_i}{d_i^3}$$

and satisfies the requirement $75 < Z < 600$ (Ns/m^3), where $n=1$ if only one electrode forms an air gap with the diaphragm, and $n=2$ if electrodes on each side of the diaphragm each form an air gap therewith, η is the dynamic viscosity of air, d_i is the width of the air gap between the relevant electrode(s) and the diaphragm, and A_i is the size of the area enclosed by four adjacent holes which are disposed at the corners of a quadrilateral in the relevant electrode(s).

4,419,546
ROTARY SWITCH

Ronald H. Arthur, Lauderhill, Fla., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 22, 1982, Ser. No. 342,030
Int. Cl.³ H01H *19/54*
U.S. Cl. 200—11 G **7 Claims**

1. A rotary multi-position switch comprising:

a housing defining a cavity;

a plurality of inwardly directed detent channel means within said cavity;

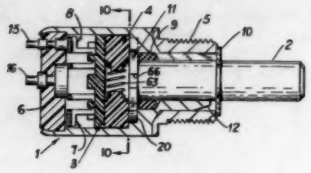
a rotor rotatably positioned within said cavity;

a resilient detent ring keyed to the rotor for rotation therewith, and having radially extending detent bumps at generally diametrically disposed positions thereon for engagement with said detent channel means;

a bridging contact keyed to the rotor for rotation therewith;

two stationary spaced apart contact means adapted to be engaged by the bridging contact in a rotational position of the rotor;

actuator means for enabling rotation of said rotor from outside the housing, said rotor including a first end in opposed facing relation with said stationary contacts and containing two ledge portions, each of said two ledge portions being recessed between walls of a generally H shaped projection, each of said ledge portions including an elongate generally rectangular key wall extension and a gutter adjacent the ends of each said key wall extension,



the other end of the rotor containing a generally round neck member projection having two diametrically disposed keyway slots therein, and said bridging contact including two spring arms which meet at a vertex in the form of a convex boss which includes a contact tab portion, said arms extending outwardly and downwardly from the convex boss, said briding contact having a keyway opening therein dimensioned to receive said key wall extension of the rotor.

4,419,547

IGNITION DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINE

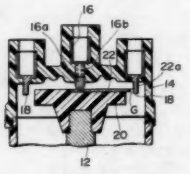
Iwao Imai, and Masazumi Sone, both of Yokosuka, Japan, assignors to Nissan Motor Company, Ltd., Yokohama and Hitachi, Ltd., Tokyo, both of, Japan

Filed Feb. 8, 1982, Ser. No. 346,744

Claims priority, application Japan, Feb. 25, 1981, 56-25408; Jul. 27, 1981, 56-116384; Aug. 3, 1981, 56-120711

Int. Cl.³ H01H *19/00*

U.S. Cl. 200—19 R **14 Claims**



1. In an ignition distributor for an internal combustion engine comprising:

a distributor cap;

an ignition distributor rotor rotatable about its axis within said distributor cap;

said distributor cap having a center electrode extending along the rotor axis of rotation and a plurality of cap electrodes circumferentially disposed about the rotor axis of rotation;

said ignition distributor rotor comprising a rotor main body of an electrically insulating material rotatable about the rotor axis of rotation and a rotor electrode supported by said rotor main body;

said rotor electrode having a discharge face which, when said ignition distributor rotor is rotated with said rotor main body, traces a circular path inwardly from the circumferentially disposed distributor cap electrodes by a predetermined distributor gap, said rotor electrode having a surface area in contact with said center electrode;

the improvement wherein either said rotor electrode or each of said cap electrodes is made of semiconductive alumina ceramics comprising a resistance element of alumina and a semiconductive element of titania.

4,419,548

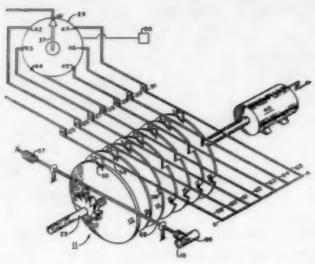
TIMING DEVICE AND METHOD

Paul D. Hales, 226 Woodbine St., High Point, N.C. 27264

Filed Sep. 7, 1982, Ser. No. 415,132

Int. Cl.³ H01H *43/00*

U.S. Cl. 200—38 R **6 Claims**



1. A timing device for supplying electric current to an appliance or the like during a selected cycle comprising: cam driving means, said cam driving means including solenoid means, a rod member, said rod member being affixed at one end to said solenoid means, resilient means, said resilient means being joined to the other end of said rod member, cam means, said cam means including a cam wheel means having a notched outer surface, said cam driving means for only initially rotating said cam means, contact support means, said contact support means having contact means, selector means, said selector means communicating with said contact means and motor means, said motor means joined to said cam means for continuing the rotation of said cam means after initial rotation during the remainder of the selected cycle.

4,419,549

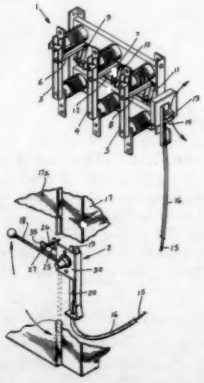
OPERATING MECHANISM FOR AN ELECTRIC SWITCH

Anthony Osborne, Duluth, Ga., assignor to Kearney-National, Inc., Atlanta, Ga.

Filed May 7, 1982, Ser. No. 375,728

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—50 A **10 Claims**



1. An operating mechanism for an electric switch disposed in

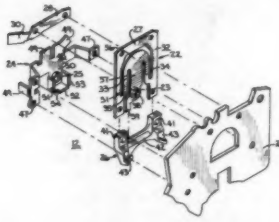
a housing having an access door, said operating mechanism comprising a movable element interconnected with the switch for imparting operating movement thereto, motivating means including a rotatable pinion and an associated reciprocable rack for imparting operating movement to said movable element, and interlocking means including a locking element secured to said pinion and a yieldably mounted locking bar having a part engageable with said locking element and having another part engageable with said door, said locking bar being arranged to engage said locking element so as to prevent switch closing movement of said motivating means so long as said access door is open.

4,419,550

ROTARY SWITCH APPARATUS HAVING A MULTIPLE ARM CONTACT SPRING SUPPORT

Gerald J. Monette, Wausau, Wis., assignor to Marathon Electric Manufacturing Corp., Wausau, Wis.

Filed Jun. 4, 1981, Ser. No. 270,596
Int. Cl.³ H01H *35/10*
U.S. Cl. 200—80 R **13 Claims**



1. A switch apparatus for a dynamoelectric machine having a speed responsive actuator moving from a first position to a second position in response at a preselected speed, comprising:

a support base;

a flat multiple arm spring unit having a plurality of laterally spaced spring arms including a pair of deflection spring arms attached to the support base and projecting from the attachment and a pair of connecting arms secured to the outer ends of the deflection arms and extending backwardly therefrom between said deflection arms and at least one contact arm secured to the inner end of both said connecting arms and extending backwardly therefrom to an outer end;

a first contact secured to the outer end of said contact arm;

a second contact mounted in opposed aligned relation to said first contact; and

coupling means secured to said deflection arms for moving said arms and thereby moving said connecting arms and contact arm to move the first contact relative to the second contact.

4,419,551

VACUUM CIRCUIT INTERRUPTER AND METHOD OF PRODUCING THE SAME

Masaru Kato, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 910,905, May 26, 1978, abandoned. This application Oct. 1, 1980, Ser. No. 192,842
Claims priority, application Japan, May 27, 1977, 52-62356; May 27, 1977, 52-62359
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **3 Claims**

1. A vacuum circuit interrupter comprising a pair of electrode contacts engagable and disengagable from each other, each of said electrode contacts consisting of an aggregate structure formed by sintering copper particles and chromium particles together in the solid phase, whereby said chromium particles are uniformly dispersed amongst said copper particles:

said chromium particles having a mean particle size of not more than 100 μm;

said copper particles having a mean particle size of not less than 5 μm;

said electrode contacts having a density of not less than 90% relative to the theoretical density thereof and

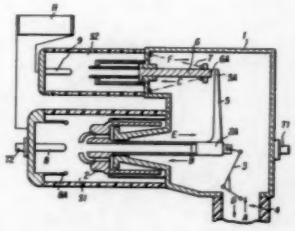
said copper being present at 80 to 20 wt. % and said chromium being present at 20 to 80 wt. %.

4,419,552

CIRCUIT BREAKER

Eiichi Haginomori, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 22, 1981, Ser. No. 227,252
Claims priority, application Japan, Apr. 25, 1980, 55-55023
Int. Cl.³ H01H *33/16*
U.S. Cl. 200—144 AP **8 Claims**



1. A circuit breaker comprising:

a main contact having a moving part and a fixed part;

a series circuit coupled in parallel with said main contact, said series circuit including a resistor coupled in series with a resistor contact, said resistor contact having a moving part and a fixed part;

means for moving said moving part of said main contact to switch said main contact;

means for closing said resistor contact and for moving said moving part of said resistor contact together with said moving part of said main contact in a closing direction; and

means for opening said resistor contact and for moving said moving part of said resistor contact independently of said moving part of said main contact in an opening direction;

wherein the moving speed of said moving part of said resistor contact in the opening direction due to said opening means is slower than the moving speed of said moving part of said main contact due to said moving means and wherein the initiation of said moving part of said resistor contact in the opening direction occurs simultaneously with the initiation of said moving part of said main contact in the opening direction.

4,419,553

VACUUM TYPE CIRCUIT BREAKER

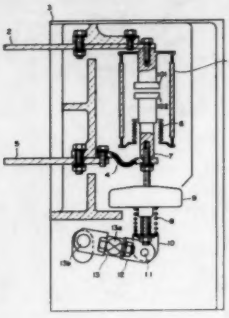
Masayuki Ohshita, Amagasaki; Toshiaki Horiuchi, Settsu; Takashi Yamanaka, Itami, and Yoshihiro Usui, Kawanishi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

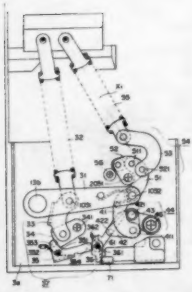
Filed Dec. 31, 1981, Ser. No. 336,433

Claims priority, application Japan, Jan. 19, 1981, 56-6799; Jan. 19, 1981, 56-6800

Int. Cl.³ H01H *33/00*

U.S. Cl. 200—144 B 4 Claims





1. A vacuum type circuit breaker comprising an energy storage link mechanism having an energy storage crank pivotally supported on a shaft, a closing spring having a line of action, the spring connected at one end thereof to said energy storage link mechanism, an operating lever connected at one end thereof to a movable electrode of a vacuum switch tube and at another end thereof to said energy storage link mechanism, and a pivotal connection between a trip latch mechanism and a connector disposed between the ends of said operating lever, wherein when said vacuum switch tube is in its open state and when said operating lever has been latched by said trip latch mechanism, said energy storage link mechanism applies energy stored in said closing spring to said another end of said operating lever as a link force in a direction which turns said operating lever around an axis of the connection to said trip latch mechanism to open the vacuum switch tube, said link force being set by said energy storage link mechanism such that it is less than a force applied to said operating lever so that the latter is turned around the axis of the connection to said trip latch mechanism by a self-closing force applied to the movable electrode of the vacuum switch tube by a difference between internal pressure of the vacuum switch tube and atmospheric pressure, and wherein the self-closing force of said vacuum switch tube overcomes said link force so as to turn said operating lever around the axis of said connection in a direction which closes the vacuum switch tube, while turning the energy storage crank, whereby the line of action of said closing spring passes across the connection between said energy storage link mechanism and the closing spring and across a dead point defined by said shaft, whereby said link force applied to said another end of said operating lever by said energy storage link mechanism is reversed to turn said operating lever around the axis of the connection to said trip latch mechanism, so that the electrodes of said vacuum switch tube are quickly closed under the action of the stored energy of said closing spring and the self-closing force of said vacuum switch tube.

4,419,554

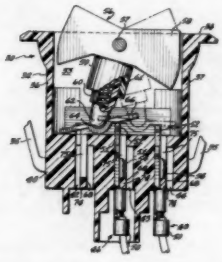
ELECTRIC SWITCHES FOR RECEIVING UNITARY INTERNAL CONTACT/WIRE TERMINAL ELEMENTS

Thomas F. Osika, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Nov. 16, 1981, Ser. No. 321,735

Int. Cl.³ H01H *1/00*

U.S. Cl. 200—284 6 Claims



1. An electric switch for receiving at least one user inserted wire terminal which couples said electric switch into an electric circuit and provides a switch contact within said electric switch comprising:

(a) a switch casing having a cavity and at least one passageway which extends from the periphery of said switch casing and opens into said cavity;

(b) a wire terminal one end of which defines a switch contact portion, said wire terminal slidably insertable into said passageway of said switch casing to a position which places said switch contact portion thereof within said cavity of said switch casing;

(c) cooperative elements of a lockable interconnection within said passageway of said switch casing and on said wire terminal for lockably retaining said wire terminal within said passageway of said switch casing when said wire terminal is slidably inserted therein;

(d) said wire terminal having a planar body portion with a resiliently deflectable latching lug extending from one of the side edges thereof;

(e) a latching ledge integral with said switch casing and having a latching surface, said latching ledge extending into said passageway of said switch casing, said latching ledge exerting a deflecting force on said latching lug of said wire terminal during slidable insertion thereof into said passageway and removing that deflecting force when said wire terminal is fully inserted therein to allow said latching lug of said wire terminal to resiliently move into latching engagement with the latching surface of said latching ledge; and

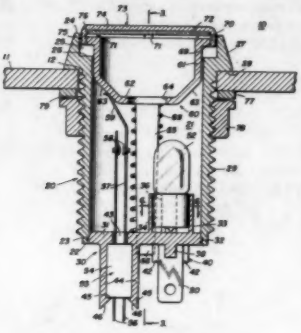
(f) switch actuating means having a movable operating means disposed within said cavity of said switch casing and movable into and out of electrically conductive contact with said switch contact portion of said wire terminal when said wire terminal is inserted into said passageway of said switch casing and maintained therein.

4,419,555

ILLUMINATED PUSH-BUTTON SWITCH ASSEMBLY

Syng N. Kim, Hoffman Estates, Ill., assignor to Wilco Corporation, Niles, Ill.

Filed Jun. 1, 1982, Ser. No. 383,811
Int. Cl.³ H01H *3/12, 9/02*
U.S. Cl. 200—314 **10 Claims**



1. An illuminated push-button switch assembly comprising: a hollow cylindrical housing, a base member closing said housing at one end thereof and having a first aperture and a pair of spaced apertures therethrough, electric switch means carried by said base member outside said housing and having switch contacts extending through said first aperture into said housing, an actuator disposed for reciprocating movement within said housing longitudinally thereof between a normal rest position and an actuating position, said actuator having a light-transmitting portion closing said housing at the other end thereof, said actuator having a cam surface disposed within said housing for engagement with and closure of said switch contacts in response to movement of said actuator from the rest position to the actuating position thereof, said actuator including a pair of resilient legs extending longitudinally of said housing and provided with cam means at the distal end thereof, said cam means being engageable with the outer edges of said a pair of spaced apart second apertures for cammed deflection to permit insertion thereof through said pair of spaced apart second apertures, said pair of resilient legs having retaining means adjacent to the distal end thereof, said pair of resilient legs resiliently returning to their original position after insertion through said pair of spaced apart second apertures for bringing said retaining means into position for engagement with the outer surface of said base member when said actuator is disposed in its normal rest position, lamp receptacle means formed integrally with said base member and projecting therefrom into said housing externally of said actuator, electric lamp means carried by said base member in said receptacle means, and bias means resiliently urging said actuator to the normal rest position thereof.

4,419,556

EXTENSION CONTROL DEVICE AND TUBING MEMBER FOR CONTROLLING SWITCH ACTUATION

Patrick H. Hare, 2027 Que St., NW., Washington, D.C. 20009

Filed Jan. 29, 1982, Ser. No. 344,036
Int. Cl.³ H01H *3/20*
U.S. Cl. 200—331 **11 Claims**

1. An extension control device for use with a wall-mounted toggle switch assembly having a switch with a protruding lever comprising:

a. an elongated member having a proximal end portion and a distal end portion graspable by a user of the extension control device; and

b. a tubing member connected to a portion of said elongated member in the vicinity of the proximal end thereof, said tubing member having:

1. a distal end portion connected to the elongated member,

2. a proximal end portion defining means for engaging a switch lever and having two spaced apart pronged portions protruding from a hollow tubular portion, the switch lever being insertable between the pronged portions into the hollow tubular portion so that the hollow tubular portion releasably grips the switch lever, one of said pronged portions being insertable into said hollow tubular portion prior to insertion of the switch lever to thereby reduce the interior cavity of said hollow tubular portion so that the hollow tubular

portion releasably grips the switch lever is a secure manner, and

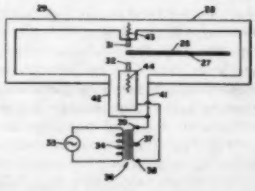
3. a notched portion defining a hinge intermediate said tubing member distal end portion and said tubing member proximal end portion so that an upper portion of said tubing member above said notched portion is angularly movable with respect to a lower portion, the lower portion extending substantially vertically when the tubing member is engaged with a switch lever and the upper portion extending skewed to the lower portion whereby up and down movement of said elongated member moves said upper portion to thereby control movement of said switch lever.

4,419,557

METHOD AND APPARATUS FOR WELDING METAL PARTS COATED WITH A THERMOPLASTIC

John S. Gellatly, LaGrange, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 4, 1982, Ser. No. 337,056
Int. Cl.³ B23K *11/10*
U.S. Cl. 219—86.25 **13 Claims**



1. A method of welding together two paramagnetic metal parts, which includes:

positioning the metal parts in a first of a pair of parallel connected conductive loop halves;

imparting relative movement between the metal parts and said first conductive loop half to incrementally reposition the metal parts in the second conductive loop half;

cyclically moving first and second welding electrodes toward each other to cyclically engage the metal parts as the metal parts are incrementally repositioned in the second conductive loop; and

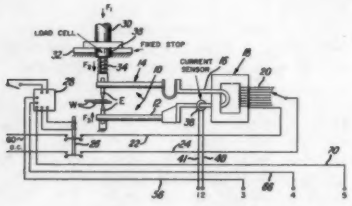
applying current pulses to the first welding electrode and through the first and second conductive loops to the second welding electrode during each engagement of the welding electrodes with the metal parts, whereupon the amount of current flow in the first and second conductive loops is proportional to the relative positions of the metal parts within the first and second conductive loops.

4,419,558

APPARATUS AND METHOD FOR MONITORING AND CONTROLLING RESISTANCE SPOT WELDING

Ariel Stiebel, Bloomfield Hills, Mich., assignor to Wagen of America, Inc., Warren, Mich.

Filed Nov. 23, 1981, Ser. No. 323,956
Int. Cl.³ B23K *11/02*
U.S. Cl. 219—109 **13 Claims**



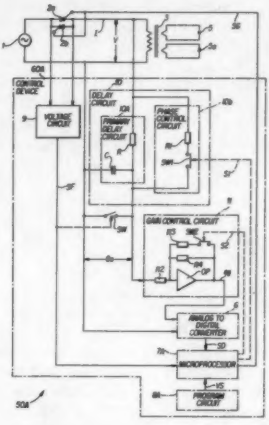
1. In resistance spot-welding apparatus that includes a pair of electrodes positioned to receive workpieces between them, means for moving one electrode toward the other to apply a squeezing force to the workpieces, means for causing an electrical current to flow from one electrode to the other through the workpieces to form a weld, and means for controlling the duration of the flow of current through the workpieces, the improvement wherein the means for moving one electrode to apply a squeezing force to the workpieces includes a member that is movable under a force in a direction to apply the squeezing force, means for applying a force to the member substantially greater than a desired squeezing force, stop means engageable by the member for limiting the movement of the member in said direction, and a mechanical spring interposed between the member and the movable electrode for applying to the movable electrode a force that varies as a function of the indentation of the electrodes into the workpieces when the current melts them, and further comprising transducer means for detecting the force exerted by the mechanical spring and generating a welding signal indicative thereof, and signal processing means responsive to the transducer means for producing a signal indicative of a change in the squeezing force on the workpieces.

4,419,559

RESISTIVE WELDER HAVING A CONTROLLED OUTPUT VOLTAGE UNAFFECTED BY SECONDARY CIRCUIT DISCONNECTION

Takatomo Izume, Urawa, and Chihiro Okado, Fuchu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 24, 1981, Ser. No. 305,223
Claims priority, application Japan, Oct. 7, 1980, 55-140303
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—110 **24 Claims**



1. A resistance welder, comprising:

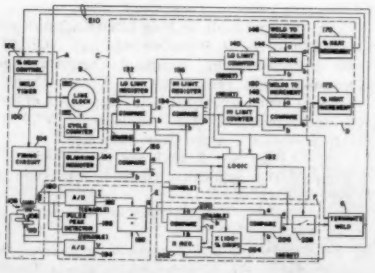
said electronic contactor means further including means coupled to receive said gate control signal for controlling an output voltage thereof appearing across said primary winding of said transformer means such that said output voltage becomes equal to a predetermined value corresponding to said predetermined reference value.

4,419,560

WELDING CONTROL WITH AUTOMATIC PERCENT HEAT ADJUSTMENT

Thomas E. Zurek, Redford, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 19, 1980, Ser. No. 218,319
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—117.1 **30 Claims**



23. A method of controlling the percent heat in a resistance welding machine comprising:

measuring the duration of each weld;

comparing each measured duration with a high limit duration and with a low limit duration; and

increasing the percent heat in response to the measured duration in at least a preselected number of welds matching or exceeding the high limit duration and decreasing the percent heat in response to the measured duration in at least a preselected number of welds failing to exceed the low limit duration.

4,419,561

METAL WIRE CATHODE FOR ELECTRON BEAM APPARATUS

Heico J. Frima, Delft, and Jan B. Le Poole, Voorschoten, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

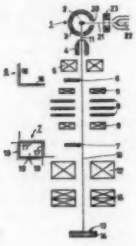
PCT No. PCT/NL80/00030, § 371 Date May 19, 1981, § 102(e) Date Dec. 18, 1980, PCT Pub. No. WO81/00929, PCT Pub. Date Apr. 2, 1981

PCT Filed Sep. 18, 1980, Ser. No. 217,885

Claims priority, application Netherlands, Sep. 19, 1979, 7906958

Int. Cl.³ B23K *15/00*

U.S. Cl. 219—121 EB **5 Claims**



1. An electron beam source comprising a longitudinally-displacable cathode wire, an anode having an aperture disposed adjacent one side of the wire, and means for applying an energy beam to a portion of the wire to effect electron emission from said side through the aperture, said side having a flattened surface for minimizing the divergence of electrons emitted thereby.

4,419,562

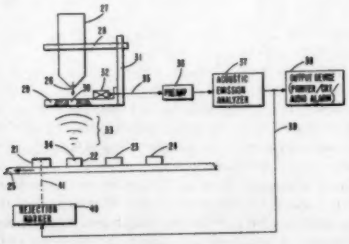
NONDESTRUCTIVE REAL-TIME METHOD FOR MONITORING THE QUALITY OF A WELD

Min-Chung Jon, East Windsor Township, Mercer County, and Vito Palazzo, Hamilton Township, Mercer County, both of N.J., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Jan. 19, 1982, Ser. No. 340,607

Int. Cl.³ B23K *9/10*

U.S. Cl. 219—130.01 **4 Claims**



1. Method for monitoring the quality of a weld on a workpiece comprising the steps of:

positioning a high frequency wideband acoustic emission sensor in noncontact spaced relation with the workpiece and in noncontact spaced relation with the weld site on said workpiece;

detecting at said acoustic emission sensor airborne shock wave signals propagating away from the weld site and having a frequency above 100 KHz; and

analyzing the detected high frequency acoustic emission signals thereby determining the quality of the weld.

4,419,563

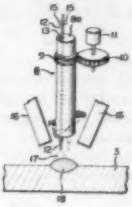
ROTARY ARC-WELDING METHOD

Hirokazu Nomura, and Yuji Sugitani, both of Tsu, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,511

Int. Cl.³ B23K *9/28*

U.S. Cl. 219—137 R **1 Claim**



1. In a rotary arc-welding method which comprises:

directing a nozzle substantially vertically toward a weld zone of at least one object of welding; feeding a consumable welding electrode through said nozzle eccentrically from the center axis of said nozzle toward said weld zone; feeding welding current to said consumable welding electrode to produce an arc between the tip of said consumable welding electrode and said weld zone to weld said at least one object of welding by means of heat from said arc; rotating said nozzle to cause a circular movement of said arc from the tip of said consumable welding electrode corresponding to the eccentricity thereof; and, feeding a shielding gas toward said weld zone to shield said arc and said weld zone from the open air;

the improvement wherein:

the diameter of said consumable welding electrode is limited within the range of from 0.8 to 1.2 mm;

said welding current is limited within the range of from 400 to 800 amperes; and,

the number of rotations of said nozzle is limited within the range of from 3,000 to 6,000 r.p.m.

4,419,564

SELF-REGULATING ELECTRIC HEATER FOR USE IN AN EARLY FUEL EVAPORATION SYSTEM

Leo Marcoux, Rehoboth, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 30, 1981, Ser. No. 248,773

Int. Cl.³ H05B *3/02*; F02M *31/12*; H01C *7/02*

U.S. Cl. 219—206 **11 Claims**

1. A heater device comprising a cast thermally conducting metal radiator body of substantial size having a first heat-receiving side and having a second, opposite side with a plurality of heat-distributing fin means upstanding therefrom for transferring heat to a zone to be heated, and

self-regulating electrical resistance heater means of ceramic material of positive temperature coefficient of resistivity arranged for transferring heat to the heat-receiving side of the radiator body,

characterized in that the heater means comprises a thin plate of substantial area of thermally conducting metal having first and second sides,

at least one self-regulating electrical resistance heater disc of

a ceramic material of positive temperature coefficient of resistivity having one side thereof bonded in electrical and thermally conducting relation to a limited portion of the first side of the thin plate,

means securing a limited portion of the thin plate in electrically conductive relation to the radiator body with its second side in closely spaced, facing, heat-transfer relation to the heat-receiving side of the radiator body, and

spring means for electrically engaging an opposite side of the at least one to connect the at least one disc in an electrical circuit for energizing the heater means.

4,419,565

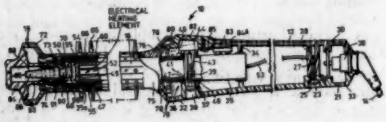
TWO-MODE STEAM BRUSH CURLER

John McGaw, Markham, Canada, assignor to Appliance Design Probe Inc., Scarborough, Canada

Filed Aug. 10, 1979, Ser. No. 65,464

Int. Cl.[3] **A45D** *1/02*; **A46B** *15/00, 7/10*; **H05B** *3/02*

U.S. Cl. 219—222 **6 Claims**



1. A hand-held steam curler for hair, comprising:

a handle,

a hollow, open-ended, perforated, metallic cylinder extending forwardly from said handle and fixed with respect thereto,

a hollow metallic cylindrical member fixedly mounted within said cylinder and having a closed end remote from said handle and an open end proximate to said handle, said member being spaced uniformly inwardly from the said cylinder adjacent the perforations of the latter, to define a first annular space therebetween,

a heating element within said cylindrical member for heating the side wall and end wall thereof,

a rotatable, perforated barrel of cylindrical form surrounding said cylinder and spaced uniformly outwardly therefrom to define a second annular space, communicating with said first annular space through said perforations in the cylinder, the barrel being restrained against axial movement and defining a mandrel for contacting the hair to be treated,

first means mounted on the end of the cylinder remote from the handle to maintain one end of the barrel uniformly spaced from the cylinder while permitting barrel rotation, said first means including selectively operable steam-producing means closing the end of said cylinder remote from said handle and capable of producing steam in said first annular space by bringing water into contact with the closed end of said cylindrical member,

second means proximate to said handle and fixed with respect thereto, for maintaining the other end of the barrel uniformly spaced from the cylinder while the barrel rotates,

and manual locking means on said handle and barrel for selectively cooperable locking and releasing of the barrel with respect to the handle and metallic cylinder.

4,419,566

HOT AIR SOLDERING AND RESOLDERING SYSTEM

William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265

Filed May 18, 1981, Ser. No. 264,362

Int. Cl.[3] **B23K** *3/04*

U.S. Cl. 219—230 **9 Claims**

1. In a temperature-controlled soldering instrument:

(a) a handle housing a temperature-control circuit;

(b) a tip assembly including a tip having an axial bore and a tip assembly sleeve extending from said tip and secured thereto;

(c) a heater element;

(d) a heater sleeve for housing said heater element and extending beyond said element, said tip assembly sleeve surrounding said heater sleeve;

(e) a retainer sleeve surrounding said tip assembly sleeve and said heater sleeve, said tip assembly sleeve being substantially shorter than said retainer sleeve to form a relatively large preheating chamber between said heater and retainer sleeves and a relatively much smaller heating chamber between said heater sleeve and said tip assembly sleeve and said tip assembly and retainer sleeve, said heating chamber being connected to the hollow bore of said tip, whereby cold air passed into said preheating chamber at a predetermined rate of flow is preheated in said preheating chamber and is further heated in said heating chamber when said heater element is heated to a predetermined temperature to deliver a jet of hot air from said hollow tip; and

(f) means for connecting said retainer sleeve to said handle.

4,419,567

HEATING ELEMENT FOR ELECTRIC WATER HEATER

Robert A. Murphy, Franklin, and George L. Fehrmann, Nashville, both of Tenn., assignors to Apcom, Inc., Franklin, Tenn.

Filed Mar. 2, 1981, Ser. No. 239,630

Int. Cl.[3] **H05B** *3/82*; **H01C** *1/00*; **F24H** *1/20*

U.S. Cl. 219—336 **2 Claims**

1. A heating element for an electric heater including a generally cylindrical tank, a threaded, bored boss on the water tank for receiving a heating element, and one or more obstructions extending inside the tank generally parallel to the tank centerline, said heating element comprising

an outer connector assembly including a cylindrical portion adapted to be threaded into the tank boss; and

a sheathed electrical heating rod including a continuous member which has opposite ends secured to said connector assembly, extends generally perpendicularly to the tank centerline when installed, and is formed in a generally W-shaped pattern with respect to the centerline of said connector cylindrical portion to thereby provide said heating rod with an effective length greater than the inside diameter of the tank, to permit said heating rod to be inserted and withdrawn through the bore of the tank boss and to permit said heating element to be rotated about the centerline of said connector threaded portion, as said connector assembly is being threaded into or out of the tank boss, without any portion of said heating rod striking

any of the obstructions inside the tank, one portion of said member extending in a first generally horizontal plane and in said pattern between said connector and a location

remote from said connector and another portion of said member extending in a second generally horizontal plane vertically spaced from said first plane and in said pattern between said connector and said remote location.

4,419,568

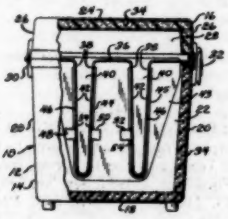
WET DRESSINGS HEATER

Ronald R. Van Overloop, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 12, 1982, Ser. No. 397,302

Int. Cl.³ F27D *11/00*

U.S. Cl. 219—441 **21 Claims**



1. A heater for wet dressing comprising:

a case having a base with sidewalls defining a cavity;

an insert within the cavity of said base and defining at least one narrow recess in said insert to receive wet dressings, said recess being capable of being heated;

an electrical heating element, electrically insulated with respect to said recess and located in close proximity to the insert recess within that portion of said cavity between the insert and the base, for heating the wet dressings;

electrical circuit means within said cavity interconnecting said heating element and a source of electric current; and

means for controlling the temperature of the heating element in the desired range of temperature of the wet dressings, said controlling means being a part of said electrical circuit means and comprising;

first means for controlling current to the heating element and for sensing the temperature associated with the heating element, said first means initially supplying current to the heating element until a first temperature is sensed substantially higher than the desired temperature range of the wet dressings, said first means interrupting current to the heating element at said first sensed temperature, said first means again supplying current to the heating element at a second sensed temperature substantially below the range of desired temperature of the wet dressings, and said first means subsequently interrupting current to the heating element when said first temperature is sensed; and

second means for controlling current to the heating element and for sensing the temperature associated with the heating element, said second means initially supplying current to the heating element until a third temperature is sensed higher than the desired temperature range of the wet dressings and lower than said first temperature, said second means interrupting current to the heating element at said third sensed temperature, said second means again supplying current to the heating element at a fourth sensed temperature below the range of desired temperature of the wet dressings and higher than said second temperature, and said second means subsequently interrupting current to the heating element when said third temperature is sensed.

4,419,569

MODULAR HEATING CABLE ASSEMBLY

Jerrold L. Colten, Lakeville, Ind., assignor to Bristol Corporation, Elkhart, Ind.

Filed Mar. 26, 1979, Ser. No. 23,884

Int. Cl.³ H05B *3/36*

U.S. Cl. 219—528 **3 Claims**

1. A modular heating cable assembly comprising two electrical cold wires extending substantially the full length of the assembly and being divided into a cold lead module and a heating module, a connector at one end of said assembly connected to said wires for connecting said wires to a source of electrical current, a female connector at the other end of said assembly connected to said wires, a resistance heating means connected at one end to one of said cold wires and connected at the other end to the other of said cold wires, and a fuse means connected to one of said cold wires in said assembly anterior to said heating wire and being responsive to an excessive amount of current in said one cold wire for interrupting the current in the event of an overload of current in said cold wires, said fuse means being a separate, insertable and removable unit adapted to be disposed between said cold lead module and said heating module and having a waterproof housing with male and female ends for connection in a waterproof relation with female and male ends, respectively, on said modules.

4,419,570

HEATING GLASS PANE

Reinhard Kalbskopf, Onex, and Otto Baumberger, Carouge, both of Switzerland, assignors to Societa Italiana Vetro - SIV - S.p.A., San Salvo, Italy

Filed Feb. 25, 1981, Ser. No. 238,087

Claims priority, application Switzerland, Mar. 3, 1980, 1658/80

Int. Cl.³ H05B *3/06*

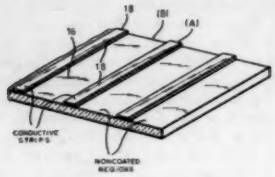
U.S. Cl. 219—522 **1 Claim**

1. A glass pane heatable by the Joule effect comprising:

(a) a transparent glass plate having a pair of broad surfaces on opposite sides thereof; and

(b) a plurality of mutually parallel, transparent, electrically conductive strips applied to one of said surfaces by vapor deposition coating of an SnO_2 layer thereon whereby said strips alternate with electrically nonconductive regions in which said glass plate is not coated, the strips defining a

total area A and said regions defining a total area B, both said areas being transparent under normal conditions, said strips being electrically connectable to a source of a heating current, the ratio A/B of said areas being between $\frac{1}{4}$

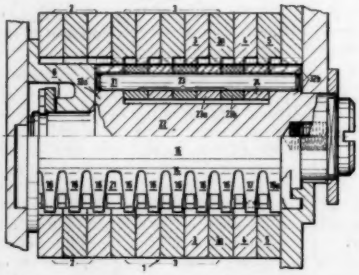


and $\frac{1}{2}$, the transparency of said area A is not less than 70% of the transparency of said area B, said conductive strips having a resistivity of 10^{-3} to 10^{-4} Ω.cm and a thickness of 0.5 to 5.

4,419,571
STEPPED-DOWN MECHANICAL COUNTING MECHANISM

Ulf Koch, Eberbach, Fed. Rep. of Germany, assignor to Esselte Pendeflex Corporation, Garden City, N.Y.

Filed Apr. 14, 1982, Ser. No. 368,206
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1981, 3116629
Int. Cl.³ B41J *45/00*; G07G *1/00*
U.S. Cl. 235—1 C **16 Claims**



1. In a mechanism for idling and advancing wheels of a stepping device having a locking shaft for supporting said wheels for rotation relative to said locking shaft and to each other to facilitate stepping, said wheels arranged in series upon said locking shaft such that a driven side surface of each of said wheels abuts and slideably engages a drive side surface of an adjacent wheel of said series, said device further having a ratchet shaft located interiorly of and rotating to and fro through a working angle relative to said locking shaft upon operation of the mechanism, said ratchet shaft supporting a series of advancing pawls for movement through said working angle upon operation of said device and for rotation relative to said ratchet shaft and to each other, each of said advancing pawls engageable with inner rims of a corresponding pair of said wheels for stepped advancing of at least one of said pair according to a switching mode, said device further comprising a control disc for controlling idling and advancing of at least one of said wheels according to said switching mode, the improvement comprising:

an adjustable link means, integral with said mechanism, for selective changing of said switching mode between different stepping modes of operation comprising different sequences of idling and advancing of said wheels;

said control disc being an end wheel of said series; and

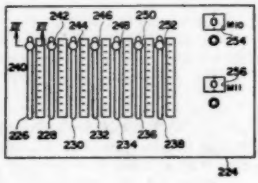
an idle stroke pawl engageable with said control disc according to said switching mode;

wherein, during operation of said mechanism in said stepping modes, said control disc is advanced by said idle stroke pawl during idling of remaining wheels of said series, and is advanced by an advancing pawl during advancing of at least one of said remaining wheels.

4,419,572
CHECK DIGIT CALCULATOR

Mutsumi Takahashi, Kawasaki; Toshio Uwabe, Tokyo; Toshio Nagase, Yokohama; Shosuke Sato, and Hideshi Matsuzawa, both of Tokyo, all of Japan, assignors to Tokyo Keiki Company Ltd. and Totec Co. Ltd., both of Tokyo, Japan

Division of Ser. No. 955,236, Oct. 27, 1978, Pat. No. 4,272,674. This application Oct. 10, 1980, Ser. No. 196,134
Claims priority, application Japan, Oct. 31, 1977, 52-130406
Int. Cl.³ G06C *27/00*; G01D *13/22*
U.S. Cl. 235—69 **3 Claims**



1. A check digit calculator for directly indicating code number check digits according to modulus 10 and/or modulus 11, comprising:

code number setting means wherein a plurality of slits are formed in the surface of a calculator case, said slits being equal in number to code number digit groups, a code number digit group is indicated along each of said slits, said digit group corresponding to a predetermined modulus and elected according to the weight of each digit in the code number associated therewith and a code number setting knob is disposed slidably along each of said slits;

check digit indicating means actuated in response to the setting of a desired code number by said code number setting means to indicate a corresponding check digit and comprising modulus 10 and/or modulus 11 check digit rotary indicators;

a plurality of moving pulleys each disposed along each of said slits so as to be slidable by the code number setting knob;

a plurality of idle pulleys provided to cooperate with corresponding moving pulleys;

a first driven pulley fixedly mounted to said modulus 10 check digit rotary indicator;

a second driven pulley fixedly mounted to said modulus 11 check digit rotary indicator;

connecting means for connecting said code number setting knobs with said plurality of moving pulleys; and

a wire fastened at one end thereof to the case of said calculator, extended around said moving pulleys and said idle pulleys to form loops, brought into contact with said first driven pulley, wound a plurality of times around said second driven pulley, and fastened at the other end thereof to said driven pulley.

4,419,573
VARIABLE DATA PRODUCT BAR CODE SALES SYSTEM

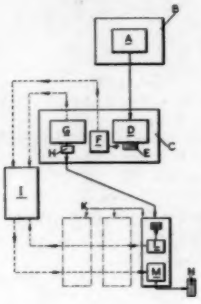
Rudolf C. von Geldern, Alphen a/d Rijn, Netherlands, assignor to Maatschappij van Berkel's Patent N.V., Leidschendam, Netherlands

Filed Mar. 17, 1981, Ser. No. 244,339

Claims priority, application United Kingdom, Mar. 19, 1980, 8009275

Int. Cl.³ G06K *15/00*

U.S. Cl. 235—383 **4 Claims**



1. In a supermarket having a central computer and at least one check-out with a bar-code reader and a register each connected to the computer for retrieving computer-stored sales data corresponding to source-coded saleable-products bearing a bar-code label, the improvement which comprises providing a service counter for sales of 'fresh' products of variable weight and/or price, said service counter comprising a dispenser of bar-code labels each having a unique number pre-printed thereon in bar-code form, means for determining sales data for each said 'fresh' product, said means being connected to said computer, a reader for identifying the unique number of a said pre-printed bar-code label and connected to said computer to thereby address a computer memory location for storage of the fresh product sales data identified by said determining means, said fresh product sales data being retrieved from the computer memory location by subsequent operation of the check-out bar-code reader by the pre-printed bar-code label corresponding to said sales data and supplied to the check-out register.

4,419,574
FOCUS DETECTING DEVICE WITH VARYING PITCH CYLINDRICAL LENS ELEMENT

Takashi Kawabata, Kamakura; Nobuhiko Shinoda; Shinji Sakai, both of Tokyo, and Takao Kinoshita, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Jul. 13, 1981, Ser. No. 282,605

Claims priority, application Japan, Jul. 18, 1980, 55-101517[U]

Int. Cl.³ G01J *1/36*

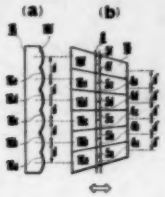
U.S. Cl. 250—204 **3 Claims**

1. In a focus detecting system for detecting the focusing condition of objective lens means to an object, comprising:

a plurality of pairs of radiation sensitive elements arranged in a linear array; and

a plurality of lens elements arranged in a linear array corresponding to the linear array of said pairs of radiation sensitive elements, each lens element being arranged to cause one radiation sensitive element in each pair of radiation sensitive elements to receive radiation from a first portion of said objective lens means, and to cause the other radiation sensitive element to receive radiation from a second portion of the objective lens means,

the improvement characterized in that said plurality of lens elements assume the form of a plurality of cylindrical lens elements arranged in a linear array corresponding to the linear array of said pairs of radiation sensitive elements,



each of the pitches between the successive cylindrical lens elements varying along the longitudinal direction of said cylindrical lens element.

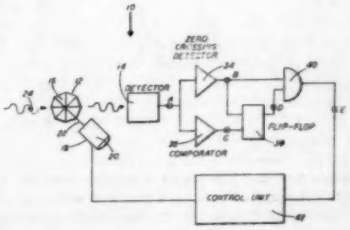
4,419,575
APPARATUS USEFUL FOR POSITIONING A LIGHT FILTER

Edward J. Lakatos, Seymour, and Paul C. Talmadge, Ansonia, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 2, 1981, Ser. No. 269,305

Int. Cl.³ G01J *3/00*

U.S. Cl. 250—226 **7 Claims**



1. An apparatus useful for reproducibly initializing a multi-segment light filter, each discrete segment thereof having a different spectral pass band; said apparatus comprising:

an optical/electrical transducer responsive to light passing through said filter;

a reference light beam having a frequency lying in the pass band of only one of said segments, said filter being in the path of said light beam and in front of said transducer, whereby said transducer producing an electrical signal only when said one segment is positioned in said path of said light beam;

means for moving said light filter in predetermined incremental steps through said path of said reference light beam;

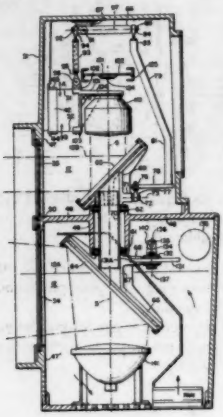
means, responsive to said electrical signal for substantially instantaneously stopping said movement whereat the leading edge of said one of said segments is positioned in said path of said reference light beam.

4,419,576

FOCUS COMPENSATION LINKAGE

Warren H. Miller, Jr., Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 17, 1981, Ser. No. 303,136
Int. Cl.³ H04N 1/04
U.S. Cl. 250—234 13 Claims



1. An optical scanning arrangement comprising:

first means for rotating an image scanning optical device about an axis of rotation, said image scanning optical device directing an image-containing beam toward a photodetector device;

second means, disposed between said image scanning optical device and said photodetector device, for focussing said beam onto said photodetector device; and

third means, responsive to the rotation of said image scanning optical device by said first means, for adjusting the distance between said second means and said photodetector device so as to maintain said image-containing beam focussed on said photodetector device irrespective of the rotational position of said image scanning optical device about said axis, said third means including

means for controllably adjusting the distance between said second means and said photodetector device, and

a rotational displacement-to-linear displacement translating link mechanism having a first arm portion pivotally coupled to said controllably adjusting means, a second arm portion extending from said first arm portion, and means for pivotally coupling said second arm portion to said first means so that rotation of said image scanning optical device by said first means about said axis causes pivotal movement of said second arm portion therewith and displacement of said first arm portion so as to cause said controllably adjusting means to change the distance between said second means and said photodetector device.

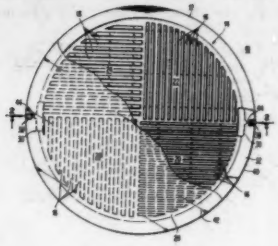
4,419,577

TEST PATTERN DEVICE FOR RADIATION DETECTOR AND METHOD OF MANUFACTURE

William R. Guth, Hoffman Estates, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Feb. 17, 1981, Ser. No. 234,656
Int. Cl.³ G01D 18/00; G02B 5/00
U.S. Cl. 250—252.1 11 Claims

1. A test pattern device for a radiation detector of a type having a closed body member formed with internal chambers arranged in a test pattern configuration and a radiation opaque material located within the chambers, characterized in that the



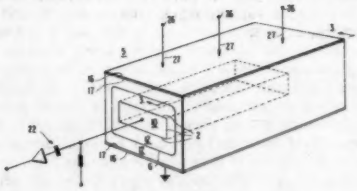
internal chambers are communicating passages and the radiation opaque material is in liquid form.

4,419,578

SOLID STATE NEUTRON DETECTOR

Kenneth A. Kress, Falls Church, Va., assignor to United States of America, Washington, D.C.

Filed Jun. 15, 1981, Ser. No. 281,255
Int. Cl.³ G01T 3/08
U.S. Cl. 250—390 17 Claims



1. A neutron detector for detecting neutrons travelling in at least a first direction and comprising at least one neutron detecting assembly, said neutron detecting assembly comprising:

a neutron-sensitive first material which produces energetic reaction particles when bombarded by neutrons;

a semiconducting second material forming a rectifying junction with said first material and containing hydrogen, said second material producing energetic free protons when bombarded by neutrons, said second material also producing electron-hole pairs as a result of energy deposited therein by said reaction particles and free protons, said electron-hole pairs migrating in opposite directions relative to said junction to produce an electrical current across said junction; and

means for measuring said electrical current flowing across said junction.

4,419,579

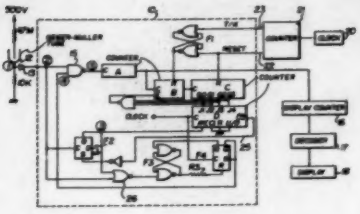
DEAD TIME COMPENSATION CIRCUIT

Philip C. East, Nepean, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Feb. 23, 1981, Ser. No. 237,254
Claims priority, application Canada, Mar. 6, 1980, 347112
Int. Cl.³ H01J 47/08
U.S. Cl. 250—374 6 Claims

1. A dead time compensation circuit for a radiation detector using a Geiger-Muller tube comprising a first counter for producing a count proportional to pulses produced by the Geiger-Muller tube during a predetermined time interval T, said first counter having an output for feeding a digital display counter, second counter means for storing a count proportional to pulses produced by the Geiger-Muller tube during a

predetermined time interval T/K where K is a constant, means for decrementing to zero the count in said second counter means following expiration of said time interval T/K, and



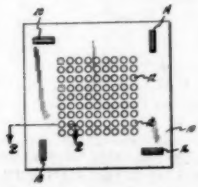
means enabled while the count in said second counter is being decremented to produce an extra pulse following receipt of a pulse from the Geiger-Muller tube which extra pulse is added to the count in said first counter.

4,419,580

ELECTRON BEAM ARRAY ALIGNMENT MEANS

David M. Walker, Westford, and John J. Carrona, Concord, both of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 26, 1981, Ser. No. 277,554
Int. Cl.³ G21K *1/08, 5/00*
U.S. Cl. 250—396 R **8 Claims**



1. Mounting and alignment apparatus for an electron beam lens optics of a type having two or more parallel plates, comprising:

four slots formed in each plate, each slot spaced from the others, each slot possessing a long linear portion, the linear portion of one slot parallel with that of the diagonally opposed slot and orthogonal with those of the laterally adjacent slots;

the slots being arranged on the plate at the corners of an imaginary rectangle; the imaginary rectangles for each plate being of the same dimensions;

at least four cylindrical rods having a diameter sufficient for the circumference thereof to contact the opposite sides of the linear portion of a slot simultaneously;

said rods and plates arranged wherein said at least four rods are each in simultaneous contact with one slot on two opposed plates; and

means for maintaining said plates and said rods in said arrangement.

4,419,581

MAGNETIC OBJECTIVE LENS FOR USE IN A SCANNING ELECTRON MICROSCOPE

Seiichi Nakagawa, Akishimashi, Japan, assignor to JEOL Ltd., Tokyo, Japan

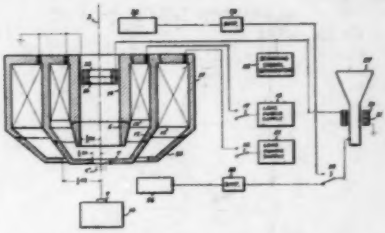
Filed Jan. 11, 1982, Ser. No. 338,622
Int. Cl.³ H01J *37/14*
U.S. Cl. 250—396 ML **3 Claims**

1. A magnetic objective lens for use in a scanning electron microscope comprising:

(a) a lower magnetic pole piece having a bore diameter D1,

(b) an upper magnetic pole piece having a bore diameter D2 which is larger than D1,

(c) an outer magnetic pole piece having a bore diameter D3 which is larger than D1,



(d) a first excitation coil for generating the magnetic field between said lower magnetic pole piece and said upper magnetic pole piece, and

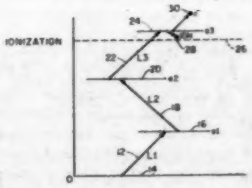
(e) a second excitation coil for generating the magnetic field between said lower magnetic pole piece and said outer magnetic pole piece.

4,419,582

USE OF AUTOIONIZATION TRANSITION ABSORPTION PEAKS IN ISOTOPICALLY SELECTIVE PHOTOEXCITATION

George S. Janes, Lincoln, and Robert E. Schlier, Concord, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Continuation of Ser. No. 861,700, Dec. 19, 1977, abandoned. This application Mar. 2, 1981, Ser. No. 239,521
Int. Cl.³ B01D *59/00*
U.S. Cl. 250—424 **39 Claims**



1. A method for ionizing particles of a selected isotope in an environment of plural isotope types comprising the steps of:

selectively exciting the particles of said selected isotope type in one or more energy steps to an excited state;

applying ionizing radiation of a predetermined broad spectral width and frequency and tuned to an ionization transition of increased cross-section having an absorption line at a predetermined ionization absorption peak for the particles in said excited state which both excites the particles from the excited state to a bound state within a predetermined energy range above the ionization level and excites the particles with a predetermined frequency which is absorbed more strongly than absorption at immediately adjacent frequencies by at least an order of magnitude.

4,419,583

POLARIZATION FLUOROIMMUNOASSAY WITH PULSED LIGHT SOURCE

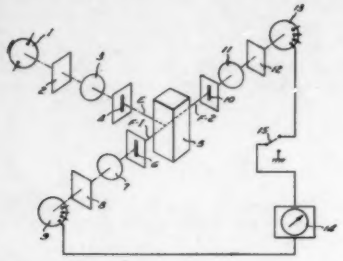
Hans G. Noeller, 1942 Deerpark Dr. #92, Fullerton, Calif. 92631

Filed May 26, 1981, Ser. No. 266,968

Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020730

Int. Cl.³ G01N *21/64, 21/00, 21/01*

U.S. Cl. 250—458.1 **3 Claims**



1. Apparatus for determining the extent of an immunoreaction by means of fluorescent tagged species, comprising the combination of:

(a) an excitation light beam source for producing a pulse of high intensity light for exciting fluorescent radiation in such tagged species;

(b) means for positioning a sample in the path of said excitation light beam;

(c) means in the excitation light beam path for polarizing the excitation light beam directed toward the sample position;

(d) means for measuring the intensity of a first fluorescent light beam emitted from the sample in one direction and at a first polarization orientation;

(e) means for measuring the intensity of a second fluorescent light beam emitted from the sample in another direction at a second polarization orientation; and

(f) means for comparing the output of the first measuring means and the second measuring means and reporting the difference between such outputs.

4,419,584

TREATING WORKPIECE WITH BEAMS

Victor M. Benveniste, Magnolia, Mass., assignor to Eaton Semi-Conductor Implantation Corporation, Beverly, Mass.

Filed Jul. 14, 1981, Ser. No. 283,507

Int. Cl.³ H01J *37/20*

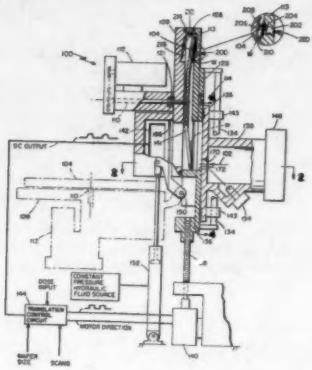
U.S. Cl. 250—492.2 **17 Claims**

1. In apparatus for treating workpieces by directing a beam at the workpieces, with resultant heating of said workpieces, said apparatus including a moving support element for repeatedly carrying a multiplicity of workpieces successively past said beam in a scanning direction, means for providing translation of said support element relative to said beam in a control direction generally orthogonal to said scanning direction, said means for providing translation including a structure that moves in said control direction with said support element but not in said scanning direction, the improvement comprising

an infrared detector mounted on said structure in position to receive black body radiation individually from said multiplicity of workpieces and intervening portions of said support element as the workpieces pass said detector in their movements in said scanning direction,

registry means to correlate the position of said moving support element passing said detector with the radiation being sensed by said infrared detector to correlate black body radiation signals with respective workpieces,

and means to correct black body radiation measurements of said workpieces for noise resulting from dark current variation,



whereby an indication of the temperatures of said individual workpieces can be obtained as said workpiece movements and beam treatment occur.

4,419,585

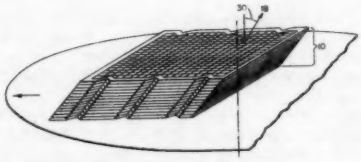
VARIABLE ANGLE SLANT HOLE COLLIMATOR

H. William Strauss, Newton Centre; Richard H. Moore, Concord, and Nathaniel M. Alpert, Swampscott, all of Mass., assignors to Massachusetts General Hospital, Boston, Mass.

Filed Feb. 26, 1981, Ser. No. 238,582

Int. Cl.³ G02B *5/00;* G21K *1/00;* H01J *1/52*

U.S. Cl. 250—505.1 **16 Claims**



1. A radiation collimator comprising:

a plurality of sheets of a generally radiation absorbing material, said sheets being apertured in a predetermined two dimensional pattern over a substantial area of said sheets; and

means for stacking said sheets with said apertures in alignment to provide a set of radiation channels through the stack of sheets with a predetermined orientation and to provide for angular variation in said predetermined orientation by skewing of said sheets within said stack;

said set of radiation channels forming a collimated view through said sheets defined by said predetermined orientation;

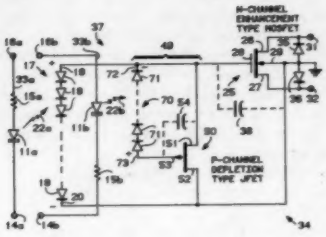
the pattern of apertures in each sheet being selected relative to the pattern of apertures in adjacent sheets of said stack to provide said predetermined orientation to the set of radiation channels with a characteristic within the range of characteristics from divergence to convergence.

4,419,586

SOLID-STATE RELAY AND REGULATOR

John P. Phipps, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1981, Ser. No. 296,756
Int. Cl.³ G02B *27/00*
U.S. Cl. 250—551 **11 Claims**



1. A photosensitive device exhibiting variable impedance between output terminals in response to light input, comprising:

first photovoltaic means for producing a first voltage in response to a first light input from a first light source;

second photovoltaic means for producing a second voltage in response to a second light input from a second light source different from said first light source;

a first field effect transistor having a first control terminal and a first reference terminal, coupled to said first photovoltaic means and responsive to said first voltage, and further having a first variable impedance current-carrying pathway coupled between said output terminals, said variable impedance varying in response to said first voltage; and

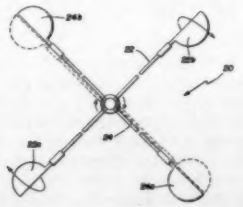
a second field effect transistor having a second control terminal and a second reference terminal coupled to said second photovoltaic means and responsive to said second voltage, and said second field effect transistor providing a second variable impedance current-carrying pathway coupled to said first control and reference terminals and wherein said second field effect transistor presents a high impedance in the presence of said second voltage and a low impedance in the absence of said second voltage.

4,419,587

OUTPUT POWER MODULATED WIND RESPONSIVE APPARATUS

William M. Benton, Middleburg, Va., assignor to Vericard Corporation, Fort Lauderdale, Fla.

Filed Sep. 11, 1981, Ser. No. 301,176
Int. Cl.³ F03B *1/02;* **F03D** *3/02;* **B63H** *13/00*
U.S. Cl. 290—44 **19 Claims**



1. Apparatus for controlling the conversion of natural wind forces into useful energy comprising:

a frame,

shaft means rotatably mounted on said frame;

first cross arm means connected to said shaft means having first impeller means disposed thereon to cause rotation of said first cross arm means and said shaft means means in response to wind;

second cross arm means connected to said shaft means and disposed at an angle to said first cross arm means and having second impeller means disposed thereon to cause rotation of said second cross arm means and said shaft means in response to wind;

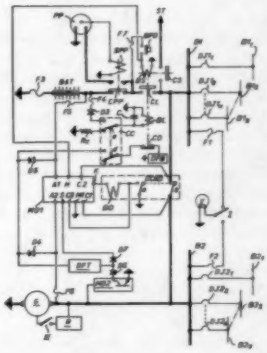
adjustment means for moving said second cross arm means about said first axis relative to said first cross arm means to change selectively the angular position of said second cross arm means and second impeller means relative to said first cross arm means and first impeller means, whereby the speed of rotation of said shaft means may be controlled for varying wind conditions.

4,419,588

SECURITY ELECTRICAL POWER DISTRIBUTION SYSTEMS FOR LIGHT AIRCRAFT EQUIPPED FOR FLIGHT ON INSTRUMENTS

Jean-Pierre Goiset, Saint-Maur-des-Fosses, France, assignor to Les Modeles Francais, Saint-Maur, France

Filed Jan. 20, 1982, Ser. No. 340,860
Claims priority, application France, Jan. 20, 1981, 81 00940
Int. Cl.³ H02J *9/06*
U.S. Cl. 307—9 **8 Claims**



1. Security electrical power distribution system for light aircraft equipped for flight on instruments and having at least one navigation system comprising a main instrument and a standby instrument, said power distribution system comprising a battery, a generator, a battery bus and a generator bus connected to respective instruments of the or each navigation system, a remote-controlled circuit-breaker interconnecting said buses, and a fault detector with two control inputs connected to respective terminals of said circuit-breaker, one power feed input connected to said battery and another power feed input connected to said generator.

4,419,589

MULTI-STAGE ELECTRICAL CONTROL SYSTEM

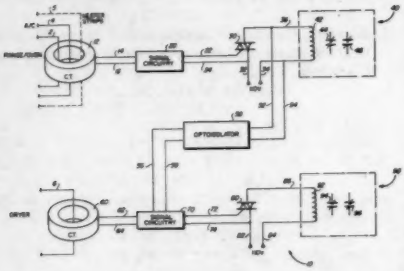
James W. Ross, 7418 E. Cholla La., Paradise Valley, Ariz. 85253

Filed Jun. 14, 1982, Ser. No. 387,830
Int. Cl.³ H02J *3/00*
U.S. Cl. 307—39 **6 Claims**

1. Load control apparatus for controlling a plurality of electrical loads having different predetermined priorities, comprising, in combination:

electrical load means, including

a first electrical load having a first priority,
a second electrical load having a second priority, and
a third electrical load having a third priority;
sensing means for sensing the "on" status of the first and second electrical loads and for providing output signals in response thereto; and
disconnect means for disconnecting the electrical loads in response to the output signals of the sensing means, including
first disconnect means for disconnecting the second electrical load in response to the sensed "on" status of the first electrical load,



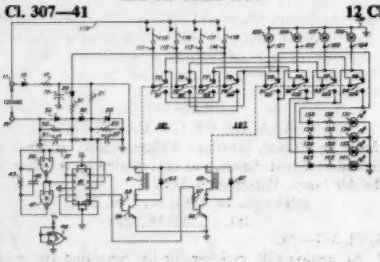
second disconnect means for disconnecting the third electrical load in response to the sensed "on" status of the first or second electrical loads,
first signal circuitry means for providing an output signal to the first disconnect means in response to the sensed "on" status of the first electrical load,
second signal circuitry means for providing an output signal to the second disconnect means in response to the sensed "on" status of the first or second electrical loads; and
isolation means for isolating the first signal circuitry means and the first disconnect means from the second signal circuitry means and the second disconnect means.

4,419,590

SEQUENCER FOR PUMP MOTORS OR THE LIKE

Earl W. Voss, Colcord, Okla., assignor to Diversified Electronics, Inc., Evansville, Ind.

Filed Feb. 10, 1982, Ser. No. 347,182
Int. Cl.³ H02J *1/00*
U.S. Cl. 307—41 **12 Claims**



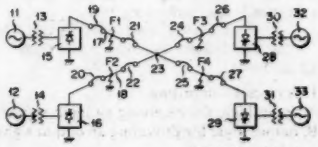
10. Sequencer apparatus for equalizing service times of multiple electrical load devices controlled to turn on one by one in response to demand for service and having at least three electrical loads and a corresponding number of control signal sources, comprising,
a first electromechanical relay having three pairs of fixed double-throw contacts and three armature contacts,
a first driver circuit connected to drive said first electromechanical relay,
a second electromechanical relay having three pairs of fixed double-throw contacts and three armature contacts,
a second driver circuit connected to drive said second electromechanical relay,
said first electromechanical relay having its normally closed double-throw contacts connected one by one to armature contacts of said second electromechanical relay,
a first set of three control signal terminals,
said second electromechanical relay having its normally closed double-throw contacts connected one by one to respective ones of said first set of control signal terminals and its normally open double-throw contacts connected one by one to different ones of said first set of control signal terminals,
a second set of three control signal terminals connected one by one to the armature contacts of said first electromechanical relay,
a solid-state binary counter with at least one input and two outputs, said two outputs being connected respectively to said first driver circuit and said second driver circuit, and
a sequencing signal source connected to the input of said binary counter,
whereby load devices may be connected to one of said sets of control signal terminals and control signal sources may be connected to the other of said sets of control signal terminals causing the sequencing of operation of said load devices to change in response to said sequencing signal source.

4,419,591

MULTITERMINAL DC POWER TRANSMISSION SYSTEM

Shoichi Irokawa, Nagareyama; Koji Imai, Fuchu; Takeichi Sakurai, Tokyo, and Kiyoshi Goto, Musashino, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 3, 1981, Ser. No. 299,142
Claims priority, application Japan, Sep. 4, 1980, 55-121711
Int. Cl.³ H02J *3/36*
U.S. Cl. 307—45 **5 Claims**



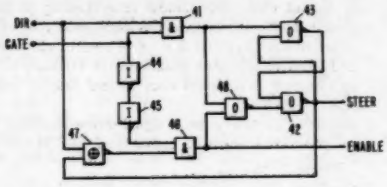
1. A multiterminal DC power transmission system having a plurality of forward converters and inverse converters, in which said forward and inverse converters are respectively provided with control units including constant voltage control means, different constant voltages are set in said converters by said constant voltage control means and the minimum value of those constant voltage set values of said forward converters is larger than the maximum value of those constant voltage set values of said inverse converters.

4,419,592

BIDIRECTION DATA SWITCH SEQUENCING CIRCUIT

Kent S. Norgren, Longmont, and Stephen E. Stucka, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 21, 1980, Ser. No. 170,374
Int. Cl.³ H03K 17/56, 5/13
U.S. Cl. 307—241 3 Claims



1. In a circuit having at least two port means for sending and receiving signals, said port means being coupled to one another by bidirectional gating means for providing, in response to an enabling signal, a signal path in one of two selectable directions, the direction of said signal path depending on a steering signal, and first and second signal source means for respectively producing a gating signal and a direction indicating signal, the improvement comprising:

asynchronous circuit means for producing said enabling signal and said steering signal in response to said first and second signal source means, said asynchronous circuit means including

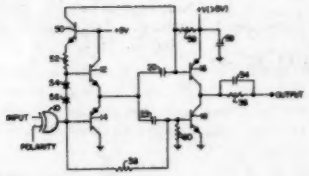
means for inhibiting said enabling signals until said steering signal is established.

4,419,593

ULTRA FAST DRIVER CIRCUIT

Neal R. Butler, Acton, and Alan R. Carson, Billerica, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1981, Ser. No. 278,775
Int. Cl.³ H03K 5/01, 17/60
U.S. Cl. 307—268 13 Claims



1. A circuit comprising:

A. input logic for receiving an input signal;

B. output logic for providing an output signal in response to a drive current;

C. logic means coupled to said input logic for providing said drive current in response to said input signal;

D. means for coupling said drive current for receipt by said output logic;

E. means for providing a high speed signal path and a low speed signal path, said high speed signal path including said means for coupling and said high speed signal path coupled between said logic means and said output logic, and said low speed signal path coupled between said input logic and said output logic, wherein said high and low speed signal paths are operative substantially independent of each other;

F. wherein said logic means includes two transistors having their respective emitters coupled together and to said output logic; and

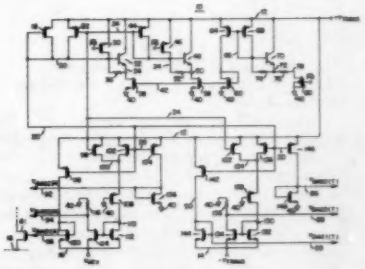
G. wherein said output logic includes two transistors having their respective collectors coupled together and also includes two capacitive elements, one end of each of said elements coupled together and to the junction of the emitters of said transistor included in said logic means, and the other end of said elements coupled to the bases respectively of the two transistors included in said output logic.

4,419,594

TEMPERATURE COMPENSATED REFERENCE CIRCUIT

Robert M. Gemmell, Carrollton, and David B. Hildebrand, Bedford, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Nov. 6, 1981, Ser. No. 319,045
Int. Cl.³ H02J 1/04
U.S. Cl. 307—297 13 Claims



1. A circuit for generating a reference current having a controlled temperature coefficient, comprising:

a bipolar transistor having a collector for coupling to a power supply,

a resistor connected between the base and emitter terminals of said bipolar transistor,

means for generating a first current having a predetermined temperature coefficient, said means for generating connected to said bipolar transistor and said resistor such that said first current is essentially equal to the sum of the collector current of said bipolar transistor and the current through said resistor, and

transistor means connected to the base terminal of said bipolar transistor and said resistor for passing said reference current through said transistor means.

4,419,595

ANALOG OR GATE CIRCUIT

Richard W. Reiner, Westlake Village, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 14, 1981, Ser. No. 311,378
Int. Cl.³ H03K 5/24
U.S. Cl. 307—355 4 Claims

1. An analog OR gate circuit for detecting the maximum instantaneous value of analog signals from multiple sources comprising:

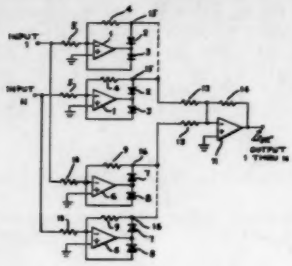
a multiplicity of gate circuit inputs, each receiving a discrete analog input signal,

a gate circuit output,

a positive half wave rectifier circuit connected to each said gate circuit input,

a negative half wave rectifier circuit connected to each said gate circuit input, the outputs of said positive half wave rectifier circuits connected to provide an OR output, the

outputs of said negative half wave rectifier circuits connected to provide an OR output, and



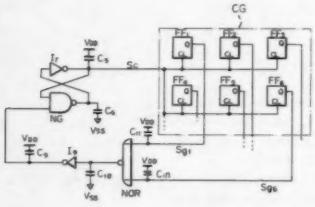
summing means summing said OR outputs and providing an output to said gate circuit output.

4,419,596

POWER ON CLEAR CIRCUIT

Hideo Kikuchi, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 5, 1980, Ser. No. 146,212
Claims priority, application Japan, May 9, 1979, 54-56774
Int. Cl.³ H03K *5/163, 17/22, 17/284*
U.S. Cl. 307—603 **29 Claims**



1. A power-on clear circuit comprising:
a flip-flop which is placed in a set state so as to provide an output signal when a power supply is turned on;
means for feeding the output signal to a circuit that is to be cleared when the power supply is turned on;
detection means for detecting that said circuit is cleared by the output signal and for providing a detection signal;
means for delaying the generation of said detection signal, said delaying means being connected to said detection means; and
means for feeding said detection signal to said flip-flop to place it in a reset state.

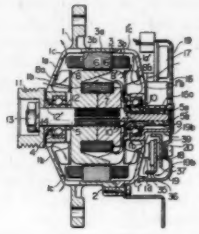
4,419,597

ALTERNATOR ASSEMBLY HAVING A RECTIFIER DEVICE IN THERMAL CONTACT WITH CASE AND COVER

Tsutomu Shiga, Aichi, and Takayasu Nimura, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 28, 1981, Ser. No. 258,293
Claims priority, application Japan, May 9, 1980, 55-63349[U]
Int. Cl.³ H02K *9/02*
U.S. Cl. 310—68 D **5 Claims**

1. In an alternator assembly the improvement comprising the combination of:
an end frame;
a rear cover attached to said end frame at the outside thereof in a manner to define a space therebetween; and
a rectifier device arranged in said space;
said rectifier device including:
a negative-side cooling fin;
a first group of diodes having their positive electrodes in contact with and supported by said negative-side cooling fin;
a positive-side cooling fin located more remote from said cover than said negative-side cooling fin so as to be upstream of the latter with respect to the cooling air flow thereover;
a second group of diodes having their negative electrodes in contact with and supported by said positive-side cooling fin, said negative-side cooling fin having an area smaller than that of said positive-side cooling fin, whereby said positive-side cooling fin is contacted by a portion of the cooling air which has not first contacted and been warmed by said negative-side cooling fin;



a terminal board formed of an insulating material for supporting a plurality of terminals each connected to one of the negative electrodes of said first group of diodes and to one of the positive electrodes of said second group of diodes;
metal members for securing together in a unitary structure said negative-side cooling fin, said positive-side cooling fin, and said terminal board that are placed one over another in superposed relation, said metal members being maintained in contact with said negative-side cooling fin but out of contact with said positive-side cooling fin; and
a spacer formed of an insulating material for keeping said negative-side cooling fin and said positive-side cooling fin out of contact with each other;
said rectifier device being arranged in the space defined by said rear cover and said end frame in such a manner that the metal members are in contact at one end thereof with said rear cover and at the other end thereof with said end frame.

4,419,598

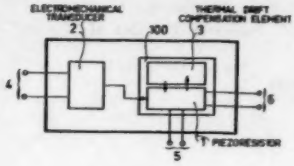
PIEZOELECTRICALLY CONTROLLED PIEZORESISTOR

Erich Spitz, and Francois Micheron, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 15, 1981, Ser. No. 331,130
Claims priority, application France, Dec. 15, 1980, 80 26543
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—311 **13 Claims**

1. An electrically controlled piezoresistor comprising at least one piezoresistive element made from a conductive particle-charged dielectric material and having one percolation point and a pair of input terminals, and at least one electromechanical transducer connected at its input terminals to an electrical control signal and acting on said piezoresistive ele-

ment via a transmitter element made from a dielectric material, means for compensating the thermal drift due to the piezoresistive element cooperating to supply an output signal which is a function of the electrical control signal.



4,419,599

PIEZOELECTRIC TRANSDUCER MADE FROM A POLYMER MATERIAL AND PROCESS FOR MANUFACTURING SAME

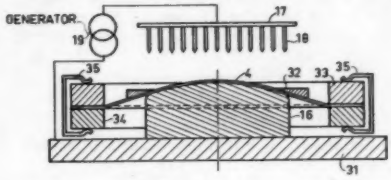
Francois Micheron, Paris, France, assignor to Thomson-CSF, Paris, France

Division of Ser. No. 179,220, Aug. 18, 1980, Pat. No. 4,345,359. This application Apr. 21, 1982, Ser. No. 370,591

Claims priority, application France, Aug. 21, 1979, 79 21086

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—311 **4 Claims**



1. In a piezoelectric transducer whose active element is formed by a polymer film forming a self-supporting structure provided with electrodes on both its faces, the part of the film between said electrodes contains at least one non-developable zone mechanically relaxed and caused to change from a non-polar to a polar phase by an electric field applied thereto; said electric filed inducing in said polymer film a macromolecular chain transition between reversed and non-reversed neighboring chains.

4,419,600

STRESS-COMPENSATED QUARTZ RESONATORS

Bikash K. Sinha, West Redding, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 204,400, Nov. 5, 1980, abandoned. This application May 27, 1981, Ser. No. 267,507

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—361 **23 Claims**

1. A stress compensated thickness-shear resonator adapted to vibrate in at least one of its fast and slow thickness-shear modes of vibration at a frequency substantially determined by the thickness thereof, said resonator being of an orientation selected from the group consisting of the orientations (yxwl) ϕ/θ defined by the loci of FIG. **10** and the orientations (yxwl) ϕ/θ defined by the loci of FIG. **11**, plus or minus 4° in ϕ and θ.

4,419,601

SPARK PLUG FOR INTERNAL COMBUSTION ENGINE

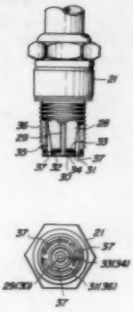
Kyugo Hamai, Yokosuka; Yasuhiko Nakagawa, Kamakura; Meroji Nakai, Yokosuka, and Ryuzaburo Maruyama, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokahama, Japan

Filed Oct. 30, 1980, Ser. No. 202,157

Claims priority, application Japan, Nov. 5, 1979, 54-143073; Mar. 10, 1980, 55-30011

Int. Cl.³ H01T *13/52, 13/32*

U.S. Cl. 313—131 A **4 Claims**



1. A spark plug for an internal combustion engine including positive and negative electrodes between which spark discharge occurs to produce self-induction electromagnetic force by means of which plasma gas is jetted into a combustion chamber of said internal combustion engine, comprising a resistive semiconductor body connecting said positive and negative electrodes to provide a creeping discharge, one of said electrodes being located at a center of the plug, and an insulator surrounding said one electrode, the other of said electrodes having a plurality of arcuate communicating apertures arranged in a circle and a cylindrical portion surrounding and spaced from said insulator to define a gas space about the insulator communicating with said combustion chamber through the apertures whereby the heat dissipation characteristics of said spark plug are a function of the volume of said gas space.

4,419,602

ELECTRIC LAMP

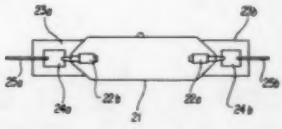
Zenzou Mitamura, Yokohama; Takashi Oosawa, Tokyo, and Akihiro Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1982, Ser. No. 341,570

Claims priority, application Japan, Jan. 23, 1981, 56-7885

Int. Cl.³ A47B *88/00, 95/00*

U.S. Cl. 313—332 **4 Claims**



3. A quartz glass envelope for an electric lamp including an improved molybdenum coupling member having increased resistance to mechanical failure at high temperatures comprising:

a pinch seal portion at either end of said glass envelope,

a molybdenum coupling member enclosed within each said pinch seal portion, said coupling member having predeter-

mined quantities of potassium and silicon dioxide dispersed therein; and,

an external conductor and a tungsten electrode welded to each said coupling member.

4,419,603

BIALKALINE PHOTOCATHODE HAVING INCREASED SPECTRAL SENSITIVITY AND METHOD OF MANUFACTURING SAME

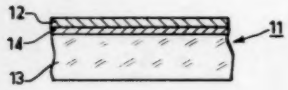
Jacques Nussli; Georges J. P. Marandas, and Antoine Farrayre, all of Brive, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,434

Claims priority, application France, Jul. 30, 1980, 80 16820

Int. Cl.³ H01J *1/14, 19/06*

U.S. Cl. 313—346 R 4 Claims



1. A photocathode comprising a layer of potassium caesium antimonide SbK_2Cs deposited on a substrate characterized in that said substrate comprises a sub-layer of manganese oxide MnO in contact with said layer of potassium caesium antimonide and an inert outer layer substrate in contact with said layer of manganese oxide.

4,419,604

LIGHT SENSITIVE SCREEN

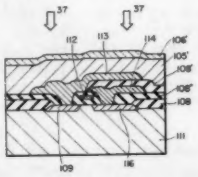
Sachio Ishioka, Tokyo; Yoshinori Imamura, Hachioji; Yasuharu Shimomoto; Saburo Ataka, both of Hinodemachi; Yasuo Tanaka, Kokubunji, and Eiichi Maruyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,611

Claims priority, application Japan, Apr. 25, 1980, 55-54155

Int. Cl.³ H01J *29/45*

U.S. Cl. 313—385 17 Claims



1. A light sensitive screen including at least a light-transmitting conductive film and at least one photoconductive layer, the light-transmitting conductive film being arranged with respect to the photoconductive layer at the side of intended incidence of light; said at least one photoconductive layer being formed of an amorphous silicon material which contains at least 5 atomic-% to 30 atomic-% of hydrogen, and which has an optical forbidden band gap in the range of 1.65 eV to 2.3 eV and an infrared absorption spectrum in which the peak component at the wave number 2,100 cm^{-1} is not smaller than that of a wave number 2,000 cm^{-1}.

4,419,605

GAS DISCHARGE DISPLAY DEVICE

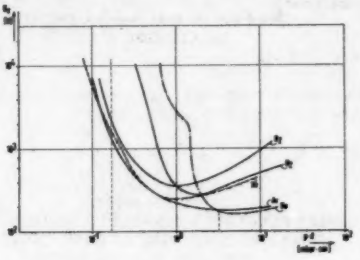
David Branston, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 30, 1980, Ser. No. 221,257

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1980, 3002930

Int. Cl.³ H01J *61/16*

U.S. Cl. 313—485 1 Claim



1. In a gas discharge display device comprising a closed envelope containing a filling gas and having a gas discharge path which is separated, by a hole matrix with control electrodes, from an electron acceleration path which is terminated by a picture screen, the improvement comprising the filling gas being helium He, to which an amount of 0.1 to 10% by volume of at least one of the gases selected from the group consisting of argon Ar, kypton Kr, xenon Xe, nitrogen N_2 and carbon dioxide CO_2 is admixed, said filling gas being at an overall pressure of 0.5 to 5 mbar.

4,419,606

MAGNETRON

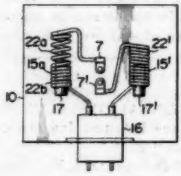
Mamoru Tsuzurabara, and Seiji Kitakaze, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 1, 1981, Ser. No. 268,905

Claims priority, application Japan, Jun. 2, 1980, 55-72768

Int. Cl.³ H01J *25/50*

U.S. Cl. 315—39.51 11 Claims



1. A magnetron comprising:

an anode structure having a cylindrical anode electrode and vanes interiorly of the anode electrode;

a cathode electrode disposed concentrically with the anode structure;

cathode input terminals connected to the cathode electrode and extending from interior to exterior of the anode structure; and

a shield case housing a filter circuit comprised of choke coils and a capacitor connected in series with the cathode input terminals, at least one of said choke coils having an air-core coil winding of at least two turns close to one of said cathode input terminals, the at least two turns of the air-core coil winding being wound at a predetermined spacing therebetween and a remainder of the at least one

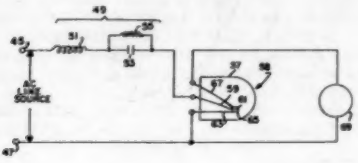
choke coil being wound about a ferrite core with adjacent turns thereof being wound in intimate contact.

4,419,607

DISCHARGE LAMP STARTER AND STARTING AND OPERATING CIRCUITRY

Nikolaos Barakitis, Haverhill, and Sheppard Cohen, Danvers, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 19, 1982, Ser. No. 398,721
Int. Cl.³ H05B 41/06
U.S. Cl. 315—73 **12 Claims**



1. Starting and operating circuitry for discharge lamps comprising:

a pair of input terminals formed for connection to a source of AC line voltage;

a ballast coupled to one of said pair of input terminals;

a starter device having an electrical conductor and a first bimetal each having one end connected to one of a first and second electrical conductors respectively and the other end connected together at a first contact and a second bimetal having one end connected to a third electrical conductor and the other end at a second contact adjacent said first contact;

means connecting said second and third electrical conductors to said ballast and to said other one of said pair of input terminals; and

means connecting a discharge lamp to said first and third electrical conductors and said starter device whereby energization of said ballast causes current flow through and heating of said first and second bimetals to flex both bimetals and separate said first and second contacts and upon starting of said discharge lamp effect current flow through said first bimetal is an amount sufficient to maintain separation of said first and second contacts.

4,419,608

HORIZONTAL DEFLECTION CIRCUIT

James E. Hicks, New Palestine, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,385
Int. Cl.³ H01J 29/70, 29/76
U.S. Cl. 315—408 **6 Claims**

1. A television horizontal deflection circuit comprising:

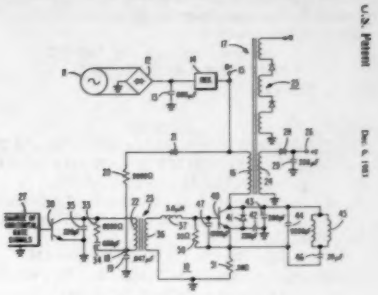
a transistor having base, emitter and collector electrodes;

a source of horizontal rate drive signals coupled to said base electrode of said transistor and to a source of reference potential and providing base current to said transistor;

a load circuit comprising variable impedance means providing load current to said collector electrode of said transistor;

horizontal deflection coil means including distortion correcting impedance means coupled between said collector electrode and said emitter electrode of said transistor; and

resistance means coupled to said emitter electrode of said transistor and to said source of reference potential, said resistance means coupled so as to be located in both the path of said load current and the path of said base current of said transistor to enable the voltage developed by the load current across said resistance means to bias the base-



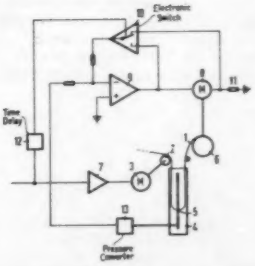
emitter junction of said transistor in accordance with said load current.

4,419,609

DEVICE FOR THE ATTENUATION OF THE MOVEMENT OF REEL MOTORS IN TAPE RECORDERS DURING STANDSTILL OF THE TAPE DRIVE ROLLER

Franz J. Meyer, Emmering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 179,110, Aug. 18, 1980, abandoned.
This application Sep. 1, 1982, Ser. No. 413,811
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936937
Int. Cl.³ H02P 3/08
U.S. Cl. 318—7 **5 Claims**



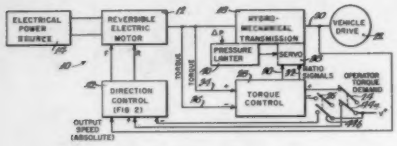
1. In a tape transport system for tape recorders including a capstan drive means for driving the tape, tape tensioning motor means responsive to motor current to control tape tension, buffer chamber means for receiving a loop of the tape between the capstan drive means and tape tensioning motor means, wherein the improvement comprises: circuitry means for the attenuation of the movement of the tape tensioning motor means after cessation of tape drive and for prevention of a constant movement of the tape loop in the buffer chamber means, said circuitry means regulating said tape tensioning motor means during tape drive via control of the motor current which flows in said tape tensioning motor means, and after said cessation of tape drive via control of the voltage at said tape tensioning means so as to attenuate movement of the tape loop in the buffer chamber means.

4,419,610

REVERSIBLE REGENERATING ELECTRIC VEHICLE DRIVE

Frederic W. Pollman, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 15, 1982, Ser. No. 357,889
Int. Cl.³ H07D *3/14*
U.S. Cl. 318—12 **8 Claims**



1. A regenerative drive system for driving a load at varying speeds in a forward or reverse direction comprising:

a variable ratio transmission having an input and an output shaft coupled so as to be capable of driving the load;

a constant speed bi-directional electric motor having an output coupled to the input of the transmission;

a source of power for energizing the motor;

means for generating a torque demand signal representing a torque to be developed by the transmission to control the direction of the motor;

means for generating in response to the torque demand signal generating means a motor direction command signal; and

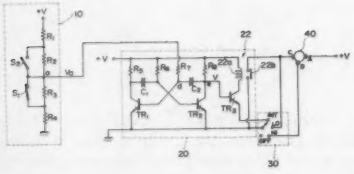
means for controlling the direction of operation of the motor in response to the motor direction command signal when the speed of the output shaft of the transmission is less than a predetermined value.

4,419,611

WIPER INTERMITTENT MOTION CONTROL DEVICE

Teruo Kawasaki; Kouichi Kogawa, both of Yokohama, and Hiroyuki Nomura, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 11, 1980, Ser. No. 186,327
Int. Cl.³ H02P *1/04*
U.S. Cl. 318—443 **12 Claims**



1. A device for use in a road vehicle having a transmission to intermittently connect a wiper drive motor means to a power source for intermittent motion of a wiper blade, comprising:

(a) first means for providing a control signal output with its magnitude increased to a first predetermined value when said vehicle starts running and to a second predetermined value higher than the first predetermined value when said transmission is in a top-gear position;

(b) second means for providing a first signal for a predetermined period of time and a second signal for a period of time variable according to the magnitude of said control signal applied thereto; and

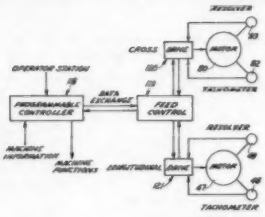
(c) third means for connecting said wiper drive motor means to said power source in response to said first signal applied thereto from said second means and for disconnecting said wiper drive motor means from said power source in response to said second signal applied thereto from said second means.

4,419,612

SINGLE WORKHEAD ELECTRO-MECHANICAL INTERNAL GRINDING MACHINE WITH GRINDING SPINDLE DIRECTLY ON CROSS SLIDE

Kazimierz J. Reda; Victor F. Dzewaltowski, both of Springfield, and Richard H. Gile, North Clarendon, all of Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation of Ser. No. 152,286, May 22, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 340,410
Int. Cl.³ G05B *19/24*
U.S. Cl. 318—571 **2 Claims**



1. A method for controlling the position and movement of a grinding wheel and spindle in a single workhead grinding machine with two slide means establishing the relative position between a rotating workpiece and the grinding wheel with the slide means being driven by first and second electric motor driven screw actuator means along first and second axes arranged perpendicular to one another and with one of the first and second axes being on the same axis as the axis of rotation of the grinding wheel spindle comprising:

(a) programming a programmable computer with first and second sets of data to control the position and drive speed of a slide means to establish the relative position and relatively velocity of movement between a grinding wheel and a rotating workpiece;

(b) interfacing an electronic feed control means with the programmable controller and an electric motor servo controller means;

(c) controlling the speed and position of the slide means by speed sensing and closed loop control of a single servo loop for the speed and position of movement of each of first and second electric motor driven screw actuator means; and

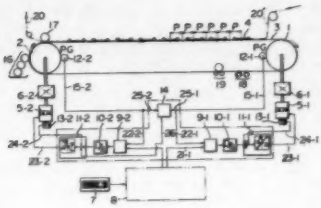
(d) controlling the first electric motor driven actuator means to control directional movement and speed of the slide means along the same axis as the axis of rotation of a grinding wheel spindle to adjust the relative position and relative velocity of movement of the grinding wheel and slide means at a grinding position and between a workpiece grinding position and a retract position;

(e) said last mentioned controlling step including providing simultaneous coarse and fine resolution of movement of the slide solely by the closed loop control of said first electric motor driven actuator means by one of the single servo loops.

4,419,613
APPARATUS FOR INTERMITTENTLY DRIVING ENDLESS BELT IN AUTOMATIC SCREEN PRINTING MACHINE

Shiro Ichinose, Kobe; Saneto Machida, Nishinomiya; Shotoku Murakami, and Teruo Furusawa, both of Iruma, all of Japan, assignors to Toshin Kogyo Co. Ltd., Hyogo, Japan

Filed Jan. 18, 1982, Ser. No. 340,035
Int. Cl.³ G05D *23/275*
U.S. Cl. 318—632 **2 Claims**



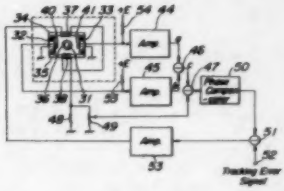
1. An apparatus for intermittently driving endless belt by two electric motors in an automatic screen printing machine, which comprises a pair of rollers, an endless belt supported on the rollers, a direct current electric motor for intermittently driving said rollers and a control mechanism for setting a repeat length of the endless belt while converting it to a pulse number, detecting the actual feed length of the endless belt as a pulse number and subtracting the detected pulse number from the set pulse number to stop the endless belt at the repeat length corresponding to the set pulse number, wherein each of the pulling and feed-out rollers supporting the endless belt is provided with a direct current electric motor capable of independently the roller, a pulse generator for detecting as a pulse number and actual feed length of the endless belt according to displacement of the roller and a digital servo mechanism for subtracting the detected pulse number from the set pulse number and reducing the speed of the direct current electric motor and stopping the same to stop the belt at the repeat length corresponding to the set pulse number, and a deviation comparing counter is arranged between the two pulse generators and at least one digital servo mechanism to compare the detected pulse number from the pulse generator on the pulling roller side with the detected pulse number from the pulse generator on the feed-out roller side and correct and control inputs to the electric motors according to the deviation, whereby any difference of the position is not produced between the two rollers at any moment during any mode of starting, running and speed reduction and therefore, no tension for driving is imposed on the endless belt.

4,419,614
APPARATUS FOR DRIVING OBJECTIVE LENS IN TRACKING DIRECTION

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Company Limited, Japan

Filed Feb. 26, 1982, Ser. No. 352,475
Claims priority, application Japan, Mar. 7, 1981, 56-33030
Int. Cl.³ G05B *1/06*
U.S. Cl. 318—653 **8 Claims**

1. In an apparatus for driving an objective lens in a tracking direction perpendicular to an optical axis of the objective lens and to a track direction comprising first and second magnet members arranged symmetrically with respect to a plane which includes the optical axis of objective lens and is at right angles to said tracking direction, first and second magnetic members arranged across the same poles of said first and second magnet members, a third magnetic member arranged within a space surrounded by said first and second magnet members and first and second magnetic members movably in the tracking direction together with the objective lens, and first and second coils wound around said first and second magnetic members, respectively substantially at middle portions thereof, said third magnetic member and objective lens being moved in said tracking direction by supplying a tracking control signal to said first and second coils, the improvement comprising



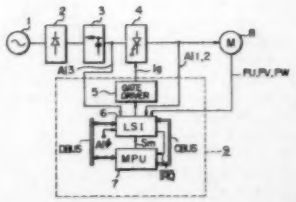
magneto-electro transducing means for detecting a magnetic flux leaked out of said third magnetic member to produce an electric signal representing a displacement of the third magnetic member and objective lens in the tracking direction; and

means for feeding back said electric signal to said tracking control signal to suppress a resonant vibration of the third magnetic member and objective lens.

4,419,615
METHOD OF CONTROLLING PULSE WIDTH MODULATED INVERTER FOR USE IN INDUCTION MOTOR DRIVE

Nobuyoshi Muto; Keijiro Sakai, and Yasuo Matsuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,268
Claims priority, application Japan, Nov. 10, 1980, 55-158669
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—811 **3 Claims**



1. A control method of a pulse width modulated inverter for driving an induction motor in a speed variable manner, utilizing a process for forming a pulse width modulating signal by a microcomputer comprising the steps of:

(a) executing a command for reading a value of a rated frequency (f_1)max externally set;

(b) calculating the number of running pulses for calculating the number N of pulses allotted to a half cycle of a modulating wave corresponding to the running frequency f_1 from a zero frequency to said running frequency f_1;

(c) calculating a PWM timer fundamental unit time t for determining a fundamental unit time of a carrier wave;

(d) calculating a crest value H wherein $H=1/(4t\times N\times f_1)$ of said carrier wave;

(e) calculating a voltage V_1 wherein $V_1=\beta f_1$ and β is a constant;

(f) calculating an amplitude ratio K_H corresponding to said voltage V_1;

(g) calculating a modulating wave level D wherein $D=K_H\cdot H$;

(h) calculating data for determining the carrier waveform by

the use of said PWM timer fundamental unit time t and said crest value H;

(i) calculating data for determining the modulating waveform by the use of said modulating wave level D; and

(j) forming said pulse width modulating signal by the use of said data for determining the carrier waveform and said data for determining the modulating waveform.

4,419,616

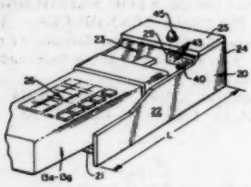
POWER-UP RACK AND METHOD OF USE IN ASSOCIATION WITH PORTABLE MICROCOMPUTERS WITHIN A REFINERY AND THE LIKE

Lew E. Baskins, Torrance, and J. Patrick Ellis, Manhattan Beach, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 29, 1980, Ser. No. 220,627

Int. Cl.³ H02J 7/00

U.S. Cl. 320—2 **5 Claims**



1. A power-up rack for a programmable microcomputer used to gather engineering data within a refinery or chemical complex for later automatic transmission to a central computer via a communication link, said microcomputer having a series of keys arranged in rows-and-columns over a top surface thereof and a first multi-pin receptacle for recharging purposes, mounted at a far end thereof comprising:

a H-shaped support means including twin up-right wall means, cross-member means connected to said wall means and end wall means forming a repository to accept and accommodate said microcomputer in a recharging electrical engagement, said repository being U-shaped throughout a substantial portion of its length, with the open side of the U facing outwardly wherein loading of said microcomputer into said rack from a loading position above said cross-member means is facilitated, said cross-member means sloping front-to-back as a function of its length, said end wall means having a second multi-pin receptacle mounted thereon and adapted to engage said first receptacle in a power-up, recharging relationship said support means including top wall means attached to said side wall means and end wall means, and a light indicator supported on said top wall means in electrical circuit with and activated by electrical engagement of said first and second receptacles, said top wall being of limited cross-wise dimension so as to extend only a slight amount into said open side of said U-shaped repository whereby when said microcomputer is loaded into said repository for recharging same, said series of keys of said microcomputer can be manipulated for testing purposes, without removal of said microcomputer from said repository.

4,419,617

THERMALLY ELECTROGENERATIVE STORAGE CELL AND GENERATOR APPARATUS

Ronald P. Reitz, P.O. Box 1543, Annapolis, Md. 21401

Continuation-in-part of Ser. No. 5,724, Jan. 23, 1979, abandoned. This application Jun. 11, 1979, Ser. No. 47,354

Int. Cl.³ H02N 1/00

U.S. Cl. 322—2 R **7 Claims**

1. Apparatus for generating electric energy from heat energy comprising:

(a) a first electrode means,

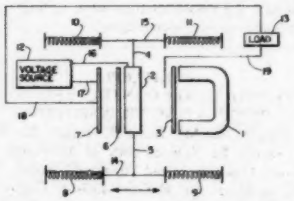
(b) a second electrode means spaced proximate said first electrode means such that a first dielectric region is established therebetween,

(c) means for initially charging said first and second electrode means,

(d) means for electrically disconnecting said first electrode means from said means for initially charging said first and second electrode means,

(e) means for decreasing the capacitance between said first and second electrode means after said first electrode means has been electrically disconnected from said charging means,

(f) means for electrically connecting said first and second electrode means in circuit with a load to be driven which is desired to be driven,



(g) said means for decreasing the capacitance between said first and second electrode means further comprising means for magnetically forcing said first electrode to move with respect to said second electrode such that the distance between said first and second electrode means is increased,

(h) said magnetic forcing means further comprising a magnetic field producing means, a ferromagnetic material positioned substantially within the magnetic field produced by said magnetic field producing means and a means whereby said ferromagnetic material may be caused to increase and decrease in temperature such that the magnetic permeability of said ferromagnetic material is made to vary in strength thereby causing the magnetic field in the space proximate said ferromagnetic material to be made to vary in strength.

4,419,618

ON-BOARD VEHICULAR NETWORK METHOD FOR EFFICIENT GENERATOR UTILIZATION

Ralf Gretsch, Erlangen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 313,649

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041201

Int. Cl.³ H02P 9/04; H02J 7/14

U.S. Cl. 322—7 **25 Claims**

1. Method of increasing the operating efficiency and supplying current of on-board vehicular networks having

an a-c generator (1) subject to widely varying operating speed and loads;

a battery (8), and loads (L) selectively connectable to the battery;

a rectifier network (4) rectifying the output from the a-c generator and connected to charge and supply the battery (8) and the loads (L)

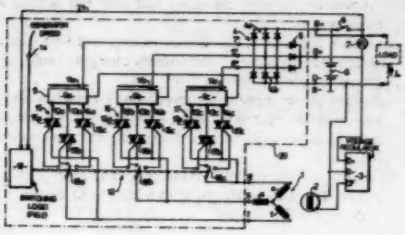
comprising the steps of

determining the speed of operation of the generator by analyzing the frequency of the output of the generator and obtaining a speed signal (1a) representative of the speed of operation of the generator;

matching the internal impedance of the generator to the

impedance of the battery and load, as the speed of the generator changes, under control of said speed signal,

by connecting a transformer of variable transformation ratio between the generator and battery and load;



and changing the transformation ratio of the transformer in dependence on said speed signal.

4,419,619

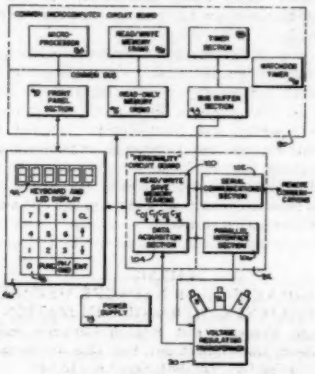
MICROPROCESSOR CONTROLLED VOLTAGE REGULATING TRANSFORMER

James A. Jindrick, Racine; James R. Hurley, Brookfield; Clyde Gilker; Naresh K. Nohria, both of Milwaukee; James A. Baranowski, Oak Creek, and Thomas G. Dolnik, Kenosha, all of Wis., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Sep. 18, 1981, Ser. No. 303,608

Int. Cl.³ G05F *1/20, 1/30*

U.S. Cl. 323—257 **23 Claims**



1. A voltage regulating transformer, comprising:

a. a first winding defining a first plurality of turns and having an associated input terminal adapted to be connected to a source of A.C. voltage;

b. a second winding, electromagnetically coupled to said first winding, defining a second plurality of turns and having an associated output terminal;

c. changer means, operated in response to an analog control signal supplied thereto, for changing the ratio of turns through which current flows through said first winding and said second winding, whereby the voltage at said output terminal varies in response to said analog control signal when A.C. voltage is applied to said input terminal;

d. voltage output signaling means, operatively connected to said output terminal, for producing a plurality of digital voltage signals representative of the instantaneous A.C. voltage at said output terminal;

e. digital input means for producing a reference digital voltage signal representative of the RMS voltage to be maintained at said output terminal over the period of said A.C. voltage;

f. digital computer means having a single microprocessor for Fast Fourier Transforming said plurality of digital voltage signals from the time domain into the frequency domain to obtain a measured digital voltage signal representative of the RMS voltage at said output terminal over the period of said A.C. voltage and for generating a digital control signal representative of the difference between said measured digital voltage signal and said reference digital voltage signal; and

g. converter means for converting said digital control signals to an analog control signal to operate said changer means,

whereby said changer means is operated in response to the RMS voltage at said output terminal over the period of the A.C. voltage applied to said input terminal.

4,419,620

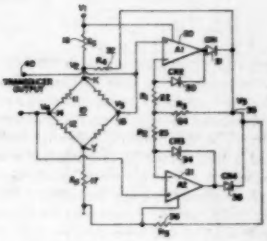
LINEARIZING CIRCUITS FOR A SEMICONDUCTOR PRESSURE TRANSDUCER

Anthony D. Kurtz, Englewood, and Donald Weinstein, Fair Lawn, both of N.J., assignors to Kulite Semiconductor Products, Ridgefield, N.J.

Filed Mar. 8, 1982, Ser. No. 356,084

Int. Cl.³ G01L *9/06*; G01R *17/10*

U.S. Cl. 323—280 **10 Claims**



1. A linearizing circuit apparatus for a differential transducer of the type employing a conventional Wheatstone bridge array having first and second input terminals for applying a source of biasing potential therebetween and first and second output terminals for obtaining a transducer output voltage therebetween, with said transducer undesirably providing a non-linear output voltage for both a positive and a negative voltage difference between said output terminals, said linearizing circuit apparatus operative to linearize said output voltage for both said positive and negative voltage differences comprising:

(a) first and second amplifiers each having a non-inverting and an inverting input terminal and an output terminal, with the non-inverting input terminal of said first amplifier coupled to said first output terminal of said bridge, and the non-inverting input terminal of said second amplifier coupled to said second output terminal of said bridge;

(b) input means coupling said inverting input terminals of said first and second amplifiers together;

(c) first threshold means coupled between the output terminal and the inverting input terminal of said first amplifier and second threshold means coupled between the output terminal and the inverting input terminal of said second amplifier;

(d) feedback means coupling said output terminals to said input means, to cause said first amplifier to operate when said voltage at said first bridge output terminal exceeds the voltage at said second bridge output terminal with said second threshold means operative to bypass said second amplifier, and to cause said second amplifier to operate when said voltage at said second bridge output terminal exceeds the voltage at said first bridge output terminal

with said first threshold means operative to bypass said first amplifier and means for coupling the output terminals of said first and second amplifiers to one of said input terminals of said bridge array.

4,419,621

MONITORING SYSTEM FOR THE CAPACITOR BATTERIES OF A THREE-PHASE FILTER CIRCUIT

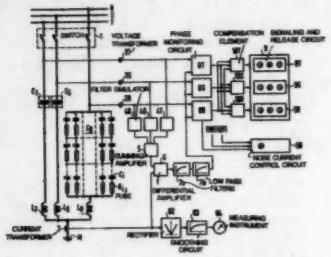
Michael Becker, Uttenreuth; Alfons Fendt, Erlangen; Dusan Povh, Nuremberg; Klaus Renz, Fürth; Gerhard Schuch, Erlangen, and Hermann Waldmann, Weiher, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,459

Claims priority, application Fed. Rep. of Germany, May 27, 1980, 3020110

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—51 **8 Claims**



1. A monitoring system for the capacitor batteries of a three-phase filter circuit having three filter legs connected in a Y-circuit configuration, the Y-circuit node being connected to a reference potential, each capacitor battery being of the type having a plurality of parallel legs, each leg having a plurality of sectional capacitors connected in series with respective fuses, adjacent ones of the sectional capacitors being coupled to one another, the system further comprising means for determining variations in the magnitude and phase of a fundamental frequency component of a zero current flowing from the Y-circuit node of the three-phase filter circuit to the reference potential, said variations being evaluated to identify defective ones of the sectional capacitors in a capacitor battery.

4,419,622

EM SENSOR FOR DETERMINING IMPEDANCE OF EM FIELD

Andrew A. Cuneo, Jr., Towson, Md., and James J. Loftus, Alex, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 19, 1981, Ser. No. 275,470

Int. Cl.³ G01R *27/00*

U.S. Cl. 324—57 R **18 Claims**

1. A method of determining the impedance of the electric and magnetic fields in the near and far fields associated with a radiating antenna comprising the steps of:

sensing said electric and magnetic field components of said antenna at a first location in said far field;

sensing electric and magnetic field components of said antenna at multiple subsequent locations;

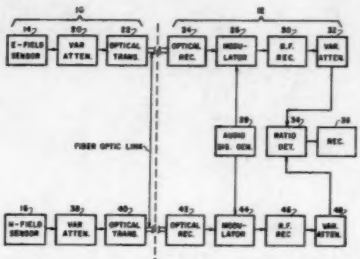
transforming each of said electric and magnetic field components into an optical electric field signal and an optical magnetic field signal;

transmitting each of said optical signals to optical signal receivers;

transforming each of said optical signals into a radio frequency electric field signal and a radio frequency magnetic field signal;

modulating said radio frequency electric field and radio frequency magnetic field signals;

determining a ratio between said modulated radio frequency electric and magnetic field siganls;



recording said ratio as a function of said first and subsequent locations.

4,419,623

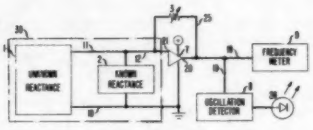
REACTANCE METER

Raymond W. Ketchledge, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 7, 1981, Ser. No. 327,925

Int. Cl.³ G01R *27/00*

U.S. Cl. 324—57 Q **8 Claims**



1. A circuit for determining the value of an unknown reactance comprising:

known reactance means of one type;

unknown reactance means of another type;

means for connecting said known reactance means in circuit with said unknown reactance means for forming a tank circuit;

amplifying means with an input and output;

adjustable resistance means connected in positive feedback relationship between the output and input of said amplifying means, the adjustable resistance means for canceling the nonreactive component of the tank circuit in such a way to permit oscillation thereof; and

means connected to the output of said amplifying means for measuring the frequency of oscillation of said tank circuit;

the product of the reactor values of said known and unknown reactance means being inversely proportional to the square of said frequency of oscillation.

4,419,624

APPARATUS FOR PHASE MEASUREMENT

Morton E. Brown, San Antonio, Tex., assignor to Southern Gas Association, Dallas, Tex.

Filed Mar. 23, 1981, Ser. No. 246,715

Int. Cl.³ G01R *25/00*

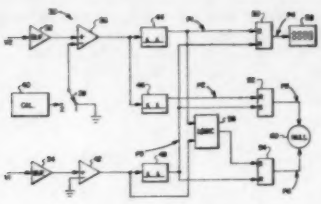
U.S. Cl. 324—83 D **5 Claims**

1. An apparatus for calibrating a pulse width reading phasemeter, comprising:

means for generating first and second consecutive pulses, wherein the pulses exist while a driving signal voltge is higher than a first calibrating voltage, and wherein both

the end of the first pulse and the beginning of the second pulse occur when a reference signal crosses a second calibrating voltage on a positive transition;

means for adjusting the relative phase between the driving and reference signals;



means for determining when the first and second pulses have the same width; and

means for generating a third pulse having a width proportional to the phase difference between the reference and driving signals.

4,419,625

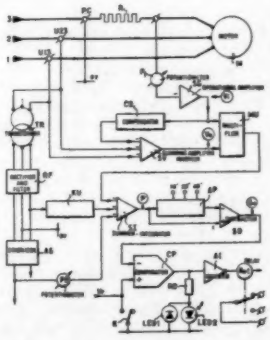
DETERMINING ASYNCHRONOUS MOTOR COUPLE

Emile Bejot, Carros, and Adriano Filiaggi, Antibes, both of France, assignors to La Telemecanique Electrique, France

Filed Dec. 5, 1980, Ser. No. 213,251

Int. Cl.³ G01R *21/00, 31/00*

U.S. Cl. 324—142 12 Claims



1. A device for the determination of the couple provided by an asynchronous motor, said device comprising:

(i) means for determining the mean power absorbed from a polyphase current supply, said means including means for measuring the current in a phase, means for generating a single phase voltage from a combination of the voltages between the respective phases, means for deriving the product of the said current and single phase voltage, means for determining the mean value of the said product; and

(ii) means for subtracting from said product, before said determination of the mean value thereof, a quantity which is a function of the said current, and which substantially represents the losses in the motor.

4,419,626

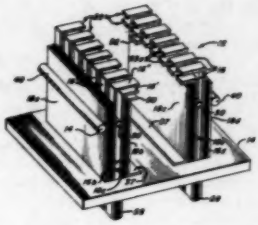
BROAD BAND CONTACTOR ASSEMBLY FOR TESTING INTEGRATED CIRCUIT DEVICES

Nicholas J. Cedrone, Wellesley Hills, and Kenneth R. Lee, Lincoln, both of Mass., assignors to Daymarc Corporation, Waltham, Mass.

Filed Aug. 25, 1981, Ser. No. 296,234

Int. Cl.³ G01R *1/06, 31/02*

U.S. Cl. 324—158 P 12 Claims



1. In a contactor assembly for electronic devices with a plurality of connection pins arrayed in at least one row, said assembly having a base, and a plurality of contacts each secured at a first end to the base and extending from the base to a second end and adapted to conduct an electrical signal to an associated pin of the device, said contacts being structured to flex resiliently from a first position where said second ends are spaced from said pins to a second position where said second ends are in electrical connection with said pins, the improvement comprising conductive plate means secured in a closely spaced, generally parallel relationship with said at least one rows of contacts, the dimensions of said plate means and said spacing producing a distributed capacitance such that the capacitive reactance induced by the presence of said plate means generally offsets the inductive reactance of said contacts and thereby present a generally characteristic impedance to said signal over a broad band.

4,419,627

MEASURING THE MOISTURE CONTENT OF MATERIALS

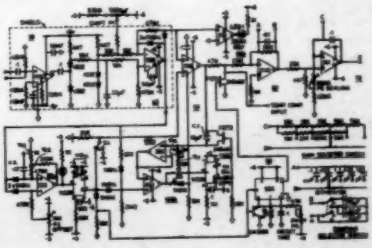
Juergen F. Schmelzer, Bolton, Canada, assignor to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed Jan. 2, 1981, Ser. No. 222,139

Claims priority, application United Kingdom, Jan. 7, 1980, 8000422

Int. Cl.³ H03K *5/00*; G08B *21/00*

U.S. Cl. 328—4 4 Claims



1. Apparatus for determining the moisture content of a material comprising means for deriving a D.C. signal having a magnitude that increases and decreases in direct proportion to increases and decreases respectively of the moisture content of

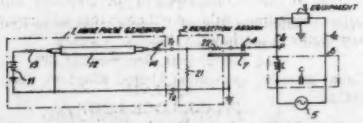
the material; comparator having first and second input terminals and an output terminal, said comparator providing an output signal at said output terminal thereof that changes from a first value to a second value different from said first value in response to said D.C. signal decreasing and that remains at said first value during application of said D.C. signal to said input terminals of said comparator and while said D.C. signal is level or increasing in magnitude; means for supplying said D.C. signal to said input terminals of said comparator; pulse producing means having an input terminal and an output terminal, said pulse producing means being responsive to said output signal of said comparator changing from said first value to said second value for producing an output pulse of predetermined pulse width at said output terminal of said pulse producing means; means for supplying said output signal of said comparator to said input terminal of said pulse producing means; a sample and hold network having first and second input terminals and an output terminal, said sample and hold network being adapted to derive at said output terminal thereof a moisture indicating output signal related to the signal applied to the first input terminal of said sample and hold network when said output pulse is applied to said second input terminal of said sample and hold network and to hold said output signal at said output terminal of said sample and hold network after said output pulse has terminated; means for supplying said output pulse to said second input terminal of said sample and hold network; means for supplying said D.C. signal to said first input terminal of said sample and hold network; timer means for producing an output signal after a predetermined time; means for resetting said timer means responsive to said output signal of said comparator changing from said first value to said second value; and means responsive to said output signal of said timer for inhibiting said sample and hold network from producing a moisture indicating output signal at least until another output pulse is produced by said pulse producing means.

4,419,628

TRANSIENT-NOISE SIMULATORS

Yoshiro Sato, Tokyo, Japan, assignor to Tohoku Metal Industries, Ltd., Sendai, Japan

Filed Mar. 13, 1981, Ser. No. 243,643
Int. Cl.³ H03K *3/86*; H03H *5/00*; G01R *27/00*
U.S. Cl. 328—67 **3 Claims**



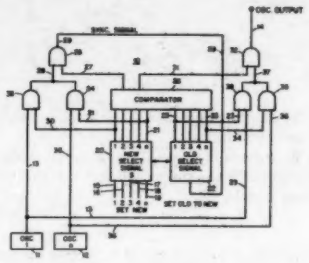
1. In a noise simulator for injecting simulated-noise pulse signals onto the AC power line of electrical equipment in a noise-simulating test, which includes pulse generator means operating as a charged delay line, and capacitor means for connecting the output of said pulse generator means to said AC power line, the improvement which comprises circuit means connected between the output of said pulse generator means and said capacitor means for absorbing any reflection wave reflected from said electrical equipment, said circuit means comprising first series resistor means connected between the output of said pulse generator means and said capacitor means and second parallel resistor means connected between the output of said pulse generator means and ground, the resistances of said first and second resistor means being determined so that the impedance at the input side of said reflection absorbing circuit means with a predetermined impedance load thereon is equal to the output impedance of said pulse generator means, while the impedance at the output side of said reflection absorbing circuit means with said generator means connected thereto is equal to said predetermined impedance, and grounded electrical conductor plate means movably disposed commonly adjacent said first resistor means and said capacitor means for controlling stray capacitance.

4,419,629

AUTOMATIC SYNCHRONOUS SWITCH FOR A PLURALITY OF ASYNCHRONOUS OSCILLATORS

Steven M. O'Brien, Norristown, PA, assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 25, 1980, Ser. No. 162,962
Int. Cl.³ H03K *3/013*
U.S. Cl. 328—72 **10 Claims**



1. A switching circuit for selecting one of a plurality of asynchronous oscillators comprising:

a plurality of asynchronous oscillators adapted to be in an ON condition,

switch selection means for generating a select signal indicative of one of said oscillators,

means responsive to said select signal for generating a new oscillator selection output signal and an old oscillator selected output signal,

comparator means coupled to means responsive to said select signal for determining if the new oscillator selection output signal is the same as the old oscillator selected output signal,

said comparator means being provided with enabling and disabling output signals,

first control selection means coupled to said asynchronous oscillators and said new oscillator selection output signal being enabled by said enabling output signals of said comparator means for generating a clock signal output in synchronism with said newly selected oscillator,

second control selection means coupled to said asynchronous oscillators and said old oscillator selected output signal being disabled by said disabling output signal of said comparator means for discontinuing the output of said old oscillator,

said clock signal output from said first control selection means being coupled to the means responsive to said select signal to change said old oscillator selected output signal to a delayed new oscillator selection output signal, and

said second control selection means being coupled to said delayed new oscillator selection output signal for providing a newly selected oscillator signal.

4,419,630

PHASE DEMODULATOR UTILIZING A FREQUENCY DIVIDER, SYNCHRONOUS FILTER, AND PHASE COMPARATOR

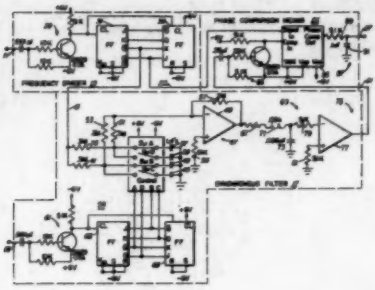
Paul H. Gilbert, Silver Spring, Md., assignor to The United State of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1981, Ser. No. 260,629
Int. Cl.³ H03D *3/02*; H03K *9/06*
U.S. Cl. 329—50 **13 Claims**

1. A phase demodulator for recovering the modulating wave from a phase-modulated wave comprising:

a frequency divider for dividing the phase-modulated wave in frequency to produce a phase-modulated subharmonic wave having an unmodulated carrier component and side-band frequencies;

a filter coupled to the output of said frequency divider for rejecting the side-band frequencies while passing the unmodulated carrier component of the phase-modulated subharmonic wave; and



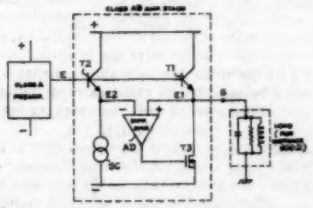
phase comparison means coupled to receive the outputs of said frequency divider and said filter for comparing the phase of the unmodulated carrier component to the instantaneous phase of the phase modulated subharmonic wave whereby an output proportional to the amplitude of the modulating wave is provided.

4,419,631

INTEGRATED CIRCUIT AMPLIFIER FUNCTIONING IN CLASS AB AND INCORPORATING CMOS (METAL OXIDE SEMICONDUCTOR) TECHNOLOGY

Jean P. Bertails; Cristian Perrin, and Louis Tallaron, all of Paris, France, assignors to Societe pour l'Etude et la Fabrication des Circuits Integres Speciaux (EFCIS), Grenoble, France

Filed Oct. 22, 1981, Ser. No. 314,025
Claims priority, application France, Oct. 23, 1980, 80 22662
Int. Cl.³ H03F *3/45, 3/26*
U.S. Cl. 330—255 **5 Claims**



1. An integrated amplifier incorporating MOS technology, and functioning in class B or AB, and characterized by the fact that its output stage comprises:

a first NPN bipolar transistor and an N-channel MOS transistor, connected in series, the junction between the emitter of the first transistor and the drain of the second forming the amplifier output;

a second NPN bipolar transistor, the base of which, in the same way as the first such transistor, receives the signal for amplification, this second transistor being connected basically as a voltage follower;

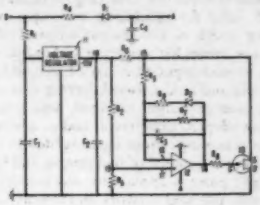
a differential amplifier, the two inputs of which are connected to the emitters of the two NPN transistors respectively, and the output of which is connected to the control grid of the MOS transistor, to control its polarization, in a way that tends to subordinate the emitter voltage of the first transistor to that of the second.

4,419,632

BIAS CIRCUIT FOR MICROWAVE FETS

James E. Morris, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 11, 1981, Ser. No. 329,868
Int. Cl.³ H03F *3/16*
U.S. Cl. 330—277 **9 Claims**



1. A circuit for biasing a field effect transistor comprising: a differential amplifier (12) with an output conductor adapted to be coupled to the gate (G) of the transistor, a first input (17) of the amplifier coupled to a reference potential portion (13) and a second input (16) of the amplifier coupled to a means (R_6) for sampling the source current (I_d) of the transistor, said amplifier adapted to control the gate voltage in response to changes in the source current to keep the source-to-drain voltage and the source current of the transistor essentially constant for gate currents no greater than a desired value;

characterized in that said circuit further includes; means (R_8) for producing a voltage difference between the output of the amplifier and the conductor to be coupled to the gate electrode in response to currents generated at said gate electrode; and

means (D_2, R_3, R_9) coupled to the second input of the amplifier, which means is responsive to said voltage between the output of the amplifier and gate conductor when said gate current exceeds a desired value for causing a change in the voltage at the second input of the amplifier sufficient to adjust the output of the amplifier so that said gate current is kept below a maximum value.

4,419,633

PHASE LOCK LOOP

Donald E. Phillips, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 29, 1980, Ser. No. 221,133
Int. Cl.³ H03L *7/06*
U.S. Cl. 331—17 **6 Claims**

1. A precision variable frequency source comprising:

coincident detector means for detecting the difference between a first pulse and a second pulse and to provide a third pulse having a pulse width that represents the difference between the first pulse and the second pulse when the first pulse occurs earlier in time then the second pulse and to provide a fourth pulse having a pulse width that represents the difference between the first pulse and the second pulse when the second pulse occurs earlier in time than the first pulse;

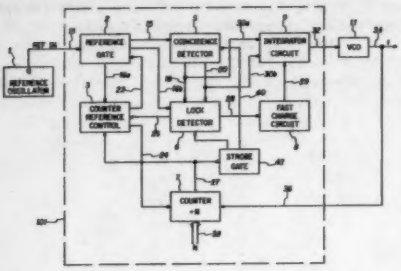
reference oscillator means for providing the first pulse;

integrator means for integrating the third pulse and the fourth pulse and to provide a control signal;

lock detector means for comparing the first pulse with the second pulse and to provide a fast charge activate signal when the falling edge of the first pulse occurs prior to the

rising edge of the second pulse or when the falling edge of the second pulse occurs prior to the rising edge of the first pulse;

fast charge means responsive to the fast charge activate signal for accelerating the operation of the integrator means;



voltage controlled oscillator means for providing an output signal having a frequency that is controlled by the control signal; and

counter means for providing the second pulse every selected number of cycles of the frequency of the output signals.

4,419,634

OSCILLATOR WHOSE FREQUENCY IS CONTROLLABLE BY A CURRENT VARIATION

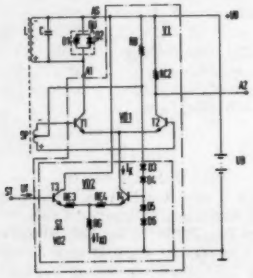
Paul Druegh, and Kalixt von Winnicki, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 21, 1981, Ser. No. 226,850

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003302

Int. Cl.³ H03B *5/12*

U.S. Cl. 331—117 R **10 Claims**



1. An oscillator whose frequency is controllable by a current change, comprising:

an amplifier including an input and an output, including a constant current source having a control input for receiving a control signal which determines the output current of said amplifier, said amplifier comprising an emitter-coupled differential amplifier including first and second transistors each including an emitter connected to said emitter of the other and a collector connected to a supply potential, and said constant current source connected to said emitters;

a parallel resonant circuit connected to said output and including a constant inductance and capacitance, said resonant circuit connected between said collector of said first transistor and the supply potential;

a feedback connection connecting said parallel resonant circuit to said input of said amplifier; and

a voltage limiter connected in parallel with said parallel resonant circuit.

4,419,635

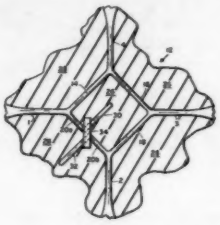
SLOTLINE REVERSE-PHASED HYBRID RING COUPLER

John Reindel, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 24, 1981, Ser. No. 305,231

Int. Cl.³ H01P *5/107, 5/18, 5/22*

U.S. Cl. 333—116 **11 Claims**



1. A microwave hybrid ring coupler comprising:

a dielectric substrate having first and second sides;

a metallized layer formed on the dielectric substrate first side;

first, second, third and fourth sections of slotline transmission medium formed in said metallized layer and interconnected so as to form a substantially enclosed area of metallized layer, the fourth slotline transmission medium having a separation formed therein and having a first slotline portion extending from one side of said separation and a second slotline portion extending from the other side of said separation;

a first shorted slotline extending from one end of said first portion;

a second shorted slotline extending from one end of said second portion; and

a slotline-to-microstrip-to-slotline transition coupled to said first and second slotline portions.

4,419,636

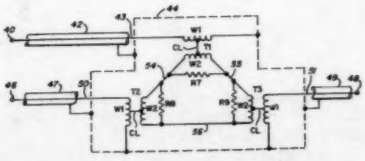
LOW FREQUENCY WIDE BAND SIGNAL COUPLER

Hong Yu, 2 Parrish Hill Dr., Nashua, N.H. 03063

Filed Oct. 22, 1981, Ser. No. 313,770

Int. Cl.³ H03H *7/48*

U.S. Cl. 333—131 **6 Claims**



1. A low frequency, wide band signal coupler comprising;

an input terminal for receiving an input signal in the frequency range of 1 KHz to 900 MHz,

a first output terminal,

a second output terminal,

three transformers each having a pair of windings including a first and second winding,

means coupling the input and first and second output terminals to respective first windings of the respective three transformers,

means coupling the three second windings in a series circuit, three isolation resistors,

and means coupling the isolation resistors each respectively across one of said second windings.

4,419,637

MAGNETOSTATIC WAVE DIOPTRIC DEVICE

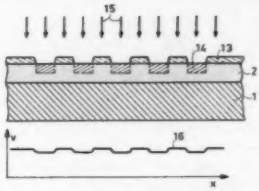
Gerard Volluet, and Pierre Hartemann, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 28, 1982, Ser. No. 343,752

Claims priority, application France, Feb. 13, 1981, 81 02865

Int. Cl.³ H03H *9/30, 9/40*

U.S. Cl. 333—147 **14 Claims**



1. A device for controlling the propagation of magnetostatic waves in the extent of a layer of magnetic material of predetermined thickness epitaxially grown on a non-magnetic crystalline substrate, said device comprising: biasing means for applying a magnetic field to said layer, transducer means for exciting said magnetostatic waves in said layer, and arranged in the path of the magnetostatic waves emerging from said transducer means, at least one ion implanted region wherein the propagation velocity of said magnetostatic waves is modified by local reduction of the effective thickness of said layer; the surface of said layer remaining substantially planar, and said effective thickness reduction arising from degenerated magnetic properties induced without removal of said magnetic material.

4,419,638

NEGATIVE RESISTANCE ELEMENT

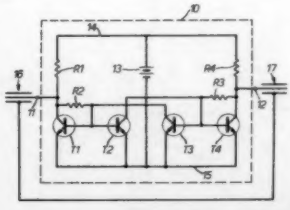
Kenneth C. Johnson, Cheadle, England, assignor to International Computers Limited, Stevenage, England

Filed Nov. 24, 1981, Ser. No. 324,432

Claims priority, application United Kingdom, Nov. 27, 1980, 8038141

Int. Cl.³ H03H *11/52*

U.S. Cl. 333—217 **2 Claims**



1. A negative resistance element including first and second terminals; a current path through the terminals; a resistor means connected in the current path; and a current mirror arrangement so responsive to current flow into one of the terminals as to produce a current flow through the resistor means in such direction as to increase the voltage at the other terminal relative to said one of the terminals from the value that would prevail in the absense of the current mirror arrangement, in which the current mirror arrangement includes two pairs of transistors, each including first and second transistors whose bases are connected, with all of the emitters of the two pairs of transistors interconnected, and in which for each transistor pair the collector of the first transistor is electrically interconnected with its base, to one of said terminals and with the collector of the second transistor of the other pair, and in which the areas of the bases of the first transistors of the two pairs are made accurately equal to each other, whilst the areas of the bases of the second transistors of the two pairs are made accurately equal to each other with the first transistor base areas a predetermined number of times greater than the base areas of the second transistors, whereby currents through the first and second transistors of a pair are always held in the same ratio to each other as the ratio of base areas.

4,419,639

KEY ASSEMBLY

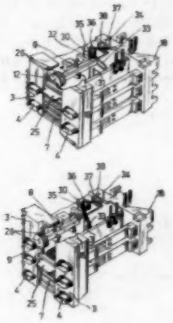
Karl-Heinz Bauer; Gerold Eckert, both of Bad Neustadt, and Wolfgang Labude, Constance, all of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 301,659

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039401

Int. Cl.³ H03J *1/06, 7/02*

U.S. Cl. 334—7 **13 Claims**



1. A key assembly for a receiving unit having a plurality of communications channels, comprising a casing with a recess for receiving a cover member, a plurality of mutually releasable depressible keys adapted to switch on storable, selectively adjustable electrical values supplied by channel memories, further comprising in association with said keys a plurality of depressible and rotatable knobs adapted to be rotated by means of a tool, a slidable cover member positioned in said recess and normally covering said knobs to conceal them, said knobs being adapted to provide channel tuning, and further comprising:

a switch for controlling an operating function of said unit,

a removable push rod and mounting means for mounting said push rod so that it is normally held by said cover member in a position wherein it holds said switch in an ON condition,

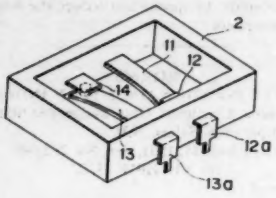
said switch having means to move said push rod in a direction out of said casing and to switch to an OFF condition when said cover member is moved from holding said push rod, and

wherein said push rod also consitutes said tool.

4,419,640
UNITARY CONTACT-TERMINAL BLADES INTEGRALLY FORMED IN A MOLDED BASE

Shunichi Agatahama, Osaka, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 10, 1980, Ser. No. 214,629
Claims priority, application Japan, Dec. 17, 1979, 54-163922; Nov. 13, 1980, 55-160426
Int. Cl.³ H01H 67/00
U.S. Cl. 335—106 3 Claims

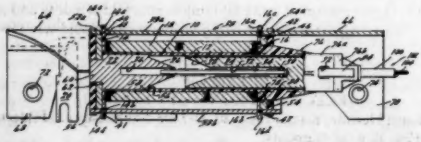


1. A contact switching device, comprising:
at least one pair of blade contacts, which comprise
a stationary contact member having one end forming a first external lead terminal and having a free end opposite said one end, and
a resilient movable contact member forming a second external lead terminal and having a free end opposite said one end,
said stationary and movable contact members overlapping each other at their free ends and being adapted for contacting each other; and
an insulating base molded as a unit with said first and second external lead terminals for supporting in position said external lead terminals.

4,419,641
SOLENOID

Michael Slavin, Troy, and Ellsworth S. Miller, Mt. Clemens, both of Mich., assignors to Lectron Products, Inc., Rochester, Mich.

Filed Apr. 26, 1982, Ser. No. 371,976
Int. Cl.³ H01F 7/00
U.S. Cl. 335—219 5 Claims

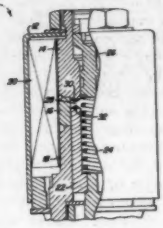


1. The combination with a solenoid of the type having a bobbin on which an electromagnetic coil is wound and a plunger axially slidable in said bobbin and normally extending axially beyond one end of said coil, and a Bowden cable of the type having an inner axially movable wire and an outer sheath around and supporting said wire, of
closure means on and carried by the mentioned end of said bobbin enclosing and slidably accepting and sealing the extending portion of said plunger, and
attaching means mounting said Bowden cable on said closure means in coaxial alignment with said plunger with said sheath fixed to and held by said closure means and said wire fixed to and movable with said plunger.

4,419,642
SOLENOID WITH SATURABLE ELEMENT

Kenneth D. Kramer, Waterloo, Iowa; Kenneth J. Stoss, Stillwater, Okla., and Gregory E. Sparks, Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 28, 1982, Ser. No. 343,651
Int. Cl.³ H01F 7/08
U.S. Cl. 335—227 10 Claims

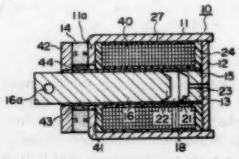


1. A solenoid comprising:
a cylindrical pole element;
a hollow cylindrical armature element axially movable with respect to the pole element;
an air gap interposed between the armature and pole elements, the gap, armature element and pole element comprising at least a portion of a magnetic flux circuit;
an annular magnetically permeable and saturable member located in the air gap, the saturable member being formed of material other than that of the armature element and pole element and having an abrupt magnetic saturation point at a flux density lower than the flux density at which magnetic saturation occurs in the armature element and the pole element; and
coil means surrounding the elements for creating a flow of magnetic flux through the flux circuit to generate a force which acts axially upon the armature element.

4,419,643
SELF-SUSTAINING SOLENOID

Shin Ojima; Kiichiro Tada, both of Yao; Toru Yoshimura, Kashihara; Naoki Yoshikawa, Sakurai, and Yoshinao Naito, Nara, all of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Apr. 14, 1982, Ser. No. 368,251
Claims priority, application Japan, Apr. 22, 1981, 56-58366[U]
Int. Cl.³ H01H 7/16
U.S. Cl. 335—234 14 Claims



1. A self-sustaining solenoid comprising:
operating and release coil means supplied with an operating and a release current;
a moving magnetic core disposed in the operating and release coil means substantially coaxially therewith in a manner to be movable along the axis thereof, one end of the moving magnetic core projecting out from one end of the coil means;

a fixed receiver disposed in the operating and release coil means at one end thereof, for receiving the moving magnetic core when the latter is attracted into the operating and release coil means, the fixed receiver being made of a magnetic material;

magnetic yoke means provided on the outside of the operating and release coil means to extend between the fixed receiver and the outer peripheral surface of the moving magnetic core for magnetic connection therebetween;

permanent magnet means disposed near at least one of the magnetically connecting portions between the magnetic yoke means and the moving magnetic core and between the magnetic yoke means and the fixed receiver in such a manner that one of the magnetic poles of the permanent magnet means is magnetically connected to the magnetic yoke means and the other pole of the permanent magnet means is magnetically connected to at least one of the moving magnetic core and the fixed receiver on which side the permanent magnet means is disposed, magnetic fluxes emanating from the permanent magnet means being mostly confined within a closed magnetic path running through the moving magnetic core, the fixed receiver and the magnetic yoke means when the moving magnetic core is in contact with the fixed receiver; and

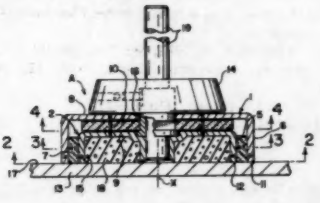
magnetic gap means provided in at least one of the magnetically connecting portions between the both ends of the magnetic yoke means and the moving magnetic core and the fixed receiver on which side the permanent magnet means is disposed, the magnetic gap means having a size smaller than the distance between the moving magnetic core and the fixed receiver in the state of the former being held in its released position spaced apart from the latter and being so designed as to permit the passage therethrough most of the magnetic fluxes of the permanent magnet means when the moving magnetic core is held at its released position.

4,419,644

SWITCHABLE PERMANENT MAGNETIC HOLDING DEVICE

Horst Baermann, Rosrath, Fed. Rep. of Germany, assignor to Max Baermann GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Jan. 14, 1983, Ser. No. 457,881
Int. Cl.³ H01F 7/02
U.S. Cl. 335—288 **14 Claims**



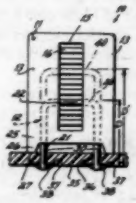
1. An on-off switchable permanent magnetic holding device for releasably holding of or onto ferromagnetic articles, said device comprising first and second pole shoes in the form of outer and inner hollow body members of magnetically conductive material and open to one side, said hollow body members being supported in fixed concentrically nested relation one within the other with their open sides facing in the same direction and their respective peripheral side walls and base end walls disposed in spaced relation to each other and their rim edge pole faces disposed in a common article-holding plane, each of said body members being identically separated at corresponding diametrical regions thereof by respective non-magnetic mediums into at least two separated pole parts, a stationary first permanent magnet of strip-like form fixedly disposed in the space between and magnetizing the said side walls of said body members and magnetically separated by non-magnetic mediums into at least two separate parts at diametrical regions corresponding to the diametrically separated regions of said body members, and a rotatable second permanent magnet disposed in the space between and magnetizing the said base end walls of said body members, said rotatable magnet being magnetized across the thickness thereof between the said base end walls with at least two pole pairs of alternating magnetic polarity to cause the poles of said rotatable second magnet, in one relative rotative position thereof, to reinforce and increase the magnetic flux in said body members and, in a second relative rotative position, to oppose and reduce the magnetic flux in said body members.

4,419,645

MULTIPLE POSITION HALF-TURN INDUCTOR

Robert D. Lennon, Cincinnati, Ohio, assignor to Standex International Corporation, Salem, N.H.

Filed Aug. 14, 1981, Ser. No. 292,940
Int. Cl.³ H01F 15/02
U.S. Cl. 336—65 **8 Claims**



1. An inductor comprising:

a coil form;

a U-shaped one-half turn coil at least partially embedded in said coil form;

said coil having two extending legs and a bight portion;

said coil form comprising,

two lateral blocks of plastic into which said legs are embedded;

and a window between said blocks;

indicia in said window indicating the inductance value of the coil by the position of the bight portion of the coil in said window;

said coil having a portion of its legs embedded in said lateral blocks of plastic, the remainder of said legs projecting below said coil form;

the bight portion of said coil lying across said window and at least a segment thereof being visible through said window.

4,419,646

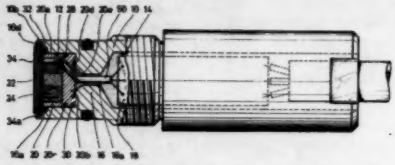
ELECTRIC PROXIMITY SENSOR

Eduard Hermle, Kirchstrasse 20, D-7303 Neuhausen a.d.Fildern, Fed. Rep. of Germany

Continuation of Ser. No. 212,757, Dec. 4, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 425,013
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2951968
Int. Cl.³ H01F 27/02
U.S. Cl. 336—90 **11 Claims**

1. An electric proximity sensor of the type which in use is exposed to pressure fluid and which comprises a casing having an interior chamber space open at one axial end and bounded circumferentially by a sidewall and at the opposite axial end by a transverse wall, a pick-up coil and pot core unit disposed within said interior space, a closure closing said one axial end and an O-ring seal circumferentially sealing between said clo-

sure and said sidewall, characterized in that a separate insert member is provided between said unit and said walls bounding said interior space, said insert member being dimensioned to fit closely with respect to said walls and comprising a cavity which is open toward said one axial end, said cavity being dimensioned to receive said unit with a close fit, said insert and said unit substantially filling said interior space, said sensor further comprising means defining a shoulder which extends



circumferentially around the inside perimeter of said sidewall at said one axial end of said casing, said closure having a circumferential margin which is disposed to radially overlap said shoulder, said O-ring seal being disposed on said shoulder, and means for retaining said closure on said casing such that said O-ring seal is axially compressed against said shoulder by the circumferential margin of said closure and forms a circumferential seal between said closure and said casing.

4,419,647

LIQUID-COOLED TRANSFORMER FOR LARGE POWER RATINGS

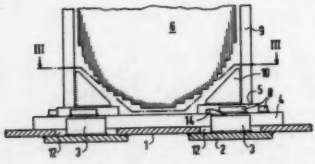
Max Herzog, Stuttgart, Fed. Rep. of Germany, assignor to Transformatoren Union Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,813

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 3012550

Int. Cl.³ H01F *27/02*

U.S. Cl. 336—92 **5 Claims**



1. Liquid-cooled transformer for large power ratings, comprising a tank having a bottom with cutouts formed therein, large-area base plates resting on said bottom of said tank, an active part having ends and being mounted in said tank, a pressure device, and means for positively locking said active part and said pressure device to said base plates without play, said base plates being disposed under one of said ends of said active part, said at least one base plate having corners including outside corners as seen in longitudinal direction of said active part, at least said outside corners being disposed above said cutouts formed in said tank bottom, said locking means including stopping blocks having a shape matched to said base plate positively locking said outside corners in position without play, said outside corners of said base plates having recesses formed therein, said recesses forming corners with inside angles for supporting said base plates in the longitudinal and transverse directions on said stopping blocks, and said locking means including inserts supporting said stopping blocks and oil tightly closing off said cutouts.

4,419,648

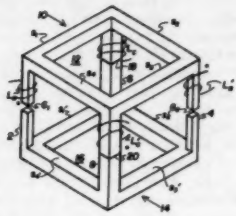
CURRENT CONTROLLED VARIABLE REACTOR

Winfried Seipel, Lebanon Township, Hunterdon County, N.J., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 24, 1981, Ser. No. 257,018

Int. Cl.³ H01H *85/50*

U.S. Cl. 336—215 **7 Claims**



1. A variable reactor, comprising

a first pair of legs, said legs having gaps therein,

a second pair of legs that are free of gaps,

a first structure providing paths for magnetic flux between given ends of said first and second pairs of legs,

a second structure providing paths for magnetic flux between the other ends of said first and second pairs of legs,

serially connected reactor windings respectively wound on each of said first pair of legs, and

serially connected control windings respectively wound on each of said second pair of legs.

4,419,649

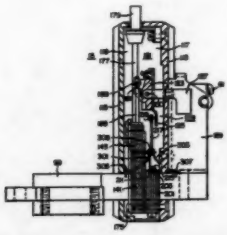
CIRCUIT BREAKER FOR USE ON AC AND DC CIRCUITS

Eugene J. Walker, and James P. Ellsworth, both of Beaver, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 4, 1981, Ser. No. 318,226

Int. Cl.³ H01H *71/16*

U.S. Cl. 337—70 **14 Claims**



1. A circuit breaker adapted for use on AC and DC circuits, comprising:

separable contacts;

an interrupter mechanism for operating said contacts between open and closed positions;

a trip device operable when actuated to cause said interrupter mechanism to automatically open said contacts;

a conductor connected in series with said contacts; and

an induction operated thermal trip assembly comprising means inductively coupled to said conductor for generating heat as a result of current induced therein by AC current flow through said conductor, said thermal trip assembly also comprising a bimetal member thermally coupled to said heat generating means and so positioned with respect to said trip device that deflection of said bimetal member due to heat generated as a result of AC current flow above a first predetermined level is operable

to actuate said trip device and cause said interrupter mechanism to open said contacts;

said thermal trip assembly also comprising thermal conduction means for thermally coupling said bimetal member to said conductor such that heat generated in said conductor by the flow of DC current therein is transmitted by conduction through said thermal conduction means to said bimetal member;

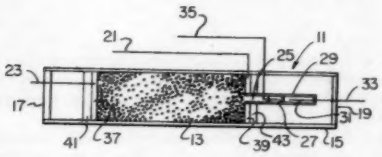
whereby DC current flow through said conductor above a second predetermined level is operable to generate heat deflecting said bimetal member to actuate said trip device and cause said interrupter means to open said contacts.

4,419,650

LIQUID CONTACT RELAY INCORPORATING GAS-CONTAINING FINELY RETICULAR SOLID MOTOR ELEMENT FOR MOVING CONDUCTIVE LIQUID

Frank T. John, Williamsville, N.Y., assignor to Georgina Chrystall Hirtle, Springville, Calif.

Filed Aug. 23, 1979, Ser. No. 69,249
Int. Cl.³ H01H *61/00*
U.S. Cl. 337—119 **38 Claims**



1. A liquid contact relay which comprises a body of solid material containing gas in a multiplicity of intercommunicating volumes therein, which body is of a sufficient resistance to the flow of electricity so that as electricity is passed through it the material thereof is heated and readily transfers heat to the gas contained therein so as to heat and expand such gas, an electrically conductive liquid which alternately completes and opens a relay circuit in different positions of such liquid, and means for operatively connecting the expandable gas of the body with the conductive liquid so that when electricity is passed through the material the gas therein is expanded and such expansion causes movement of the liquid to change the relay circuit to open or closed state from its previous condition.

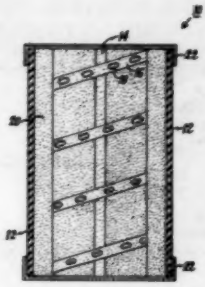
4,419,651

HIGH VOLTAGE CURRENT LIMITING FUSE HAVING A FUSE ELEMENT SUSCEPTIBLE TO OXIDATION AND ESPECIALLY SUITED FOR HIGH OPERATING TEMPERATURES

John G. Leach, Hickory, N.C., assignor to General Electric Company, King of Prussia, Pa.

Filed Jun. 24, 1982, Ser. No. 391,772
Int. Cl.³ H01H *85/04*
U.S. Cl. 337—159 **4 Claims**

1. A hot-running current limiting fuse for running at high operating temperatures in the range of 125° to 250° C. and having a fuse element of a metallic material which in the presence of free air is highly susceptible under said high temperature conditions to the formation thereon of a brittle weakly-adherent oxide coating, said fuse element having a predetermined time-current characteristic and a predetermined thickness dimension, said current limiting fuse comprising a sealed, non-porous casing enclosing the fuse element so as to provide a sealed environment for the fuse element and so as to severely limit oxygen diffusion into said environment, a pulverulent filler within the casing in which the fuse element is located, a gas within the casing in which said element and filler are located, said gas being of such a character as to make no significant improvement in the corona performance of the fuse as compared to the fuse's corona performance with free air therein, said fuse element having a thickness dimension sufficiently great that the oxide layer that may accumulate onto said fuse element over a period of 15 years in service does not significantly affect said predetermined time-current characteristic of the fuse element during said period, the seal of the casing being sufficiently effective that the oxygen entry rate is sufficiently significantly limited over said 15 year period to limit the thickness of any such oxide layer to less than approximately 2 percent of the thickness dimension of said fuse element.

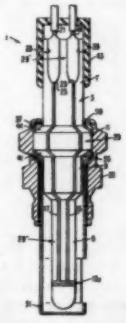


4,419,652

TEMPERATURE SENSOR

Willard R. Balmforth, Wood County; David C. Weber, Lucas County, and Michael L. Gibbons, Seneca County, all of Ohio, assignors to Bendix Autolite Corp., Fostoria, Ohio

Filed Oct. 9, 1981, Ser. No. 309,877
Int. Cl.³ H01C *3/04*
U.S. Cl. 338—28 **6 Claims**



1. In a temperature sensing apparatus having a generally cylindrical dielectric support with a first end surface portion, a center surface portion and a second end surface portion, temperature sensing film means on said first end surface portion, and a threaded fixturing shell encapsulating at least the center portion of said support, the improvement comprising:

a continuous integral protuberance extending from said center surface portion;

an electrically conductive film means extending from said temperature sensing means at said first end surface portion, along said protuberance and terminating at said second end surface portion; and

a dielectric coating encasing at least said conductive film means at said protuberance, said protuberance providing a mounting seat for the threaded fixturing shell and said

dielectric coating providing electrical isolation between said conductive film means and said fixturing shell to assure that a signal generated by said sensing film means is transmitted to said second end surface portion without interruption.

4,419,653

VARIABLE RESISTANCE SWITCH

Helmut Waigand, St. Georgen, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,394

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039256

Int. Cl.³ H01C *10/10*

U.S. Cl. 338—114 **5 Claims**

1. Variable resistance switch of a continuously-variable resistance pressure-dependent measurement sensor for triggering a switching operation of an electrical evaluating circuit through a compressive loading, comprising an elastic layer formed of elastomeric material interspersed with electrically conductive particles and being deformable with increasing application of force, said elastic layer being pan-shaped and having a lower substantially planar surface, and a conductive surface being in contact with said lower substantially planar surface of said elastic layer.

4,419,654

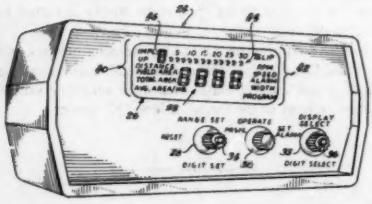
TRACTOR DATA CENTER

Robert C. Funk, Liberty, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Jul. 17, 1981, Ser. No. 284,571

Int. Cl.³ B60Q *1/00*

U.S. Cl. 340—52 R **17 Claims**



1. A monitoring apparatus for a vehicle including a plurality of sensors for detecting a plurality of vehicle functions and conditions and for producing corresponding sensor signals, said monitoring apparatus comprising: a console including operator actuatable control means, and control circuit means including means for calculating wheel slippage of at least one drive wheel of said vehicle, said calculating means including means responsive to sensor signals corresponding to the ground speed of said vehicle and to sensor signals corresponding in a predetermined fashion to the rotational speed of said at least one drive wheel for calculating a predetermined relationship therebetween; and said control circuit means including recording means responsive to actuation of said operator actuatable control means for recording said calculated relationship as a reference value when said vehicle is being operated under conditions where there is substantially no slippage of said drive wheel, thereby calibrating said calculating means to calculate wheel slippage in response to said sensor signals corresponding to ground speed and to rotational speed and in accordance with said reference value.

4,419,655

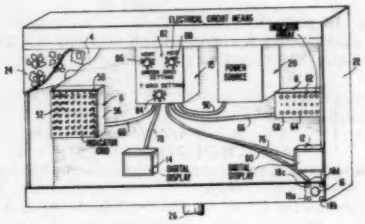
GOLF COURSE PLAY INDICATOR DEVICES

Brian E. May, Amsterdam, N.Y., assignor to Precision Golf Design, Inc., Ballston Spa, N.Y.

Filed Jul. 30, 1980, Ser. No. 173,951

Int. Cl.³ G08B *23/00*; A63B *67/02*

U.S. Cl. 340—323 R **14 Claims**



1. A golf course play indicator device comprising:

a display panel which carries a graphic representation of the layout of a hole of a golf course including the tee and the green comprising a cup,

a grid of a multiplicity of electrically energizable indicators arranged in vertical and horizontal rows within said representation of said green,

an array of a multiplicity of electrically energizable indicators arranged in two spaced apart rows within said representation of said tee,

an electrically energizable and changeable digital display unit to indicate the distance from the tee to said cup on said green,

electrical circuit means comprising first switch means to selectively energize one of said indicators of said grid to indicate said cup position on said green and second switch means to energize one indicator in each of said two rows in said array to indicate a tee-off line on said tee,

and

means to automatically change said digital display of distance in response to changes made to said first and second switch means.

4,419,656

METHOD AND APPARATUS FOR DIGITAL CONVERTER TESTING

Edwin A. Sloane, Los Altos, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Nov. 7, 1980, Ser. No. 204,979

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 CC **20 Claims**

1. A method for calibrating a digital-to-analog converter comprising the steps of:

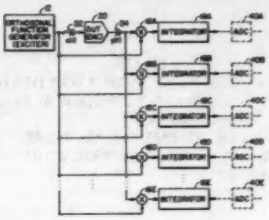
generating a digital signal consisting of a set of orthogonal functions, each orthogonal function being binary weighted such that the synthesis of said digital signal is a substantially maximum entropy function;

applying said digital signal to the input of a digital-to-analog converter to be calibrated in order to produce an output response signal;

multiplying the output response signal by an orthogonal function; and

integrating the multiplied signal through a calibrated analog

signal integrator for the duration of the orthogonal function duration to produce an estimate of the dynamic weight of



each selected bit of the digital-to-analog converter to be tested.

4,419,657

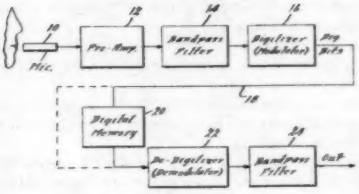
SPEECH DIGITIZATION SYSTEM

Richard T. Gagnon, Rochester, Mich., assignor to Federal Screw Works, Detroit, Mich.

Continuation of Ser. No. 880,996, Feb. 24, 1978, abandoned. This application Jan. 17, 1982, Ser. No. 338,521

Int. Cl.³ H03K *13/05*

U.S. Cl. 340—347 R **13 Claims**



1. In a companded speech digitization system including a digitizer circuit for generating a digital approximation of a bipolar analog audio input signal and a de-digitizer circuit for substantially reconstructing said audio signal from said digital approximation; a digitizer circuit comprising:

digitizer means for producing said digital approximation by converting said analog audio signal to a digital output signal in accordance with an amplitude function signal, including comparator means for comparing said audio signal to a reference signal that is directly related to said amplitude function signal; and

generator means responsive to said digital output signal for generating said amplitude function signal in accordance with said digital output signal, including averaging means for converting said digital output signal to a corresponding analog signal and circuit means for subtracting amplitude bias from said amplitude function signal so that a substantial duty cycle is maintained on at least the least significant bit in said digital output signal throughout the entire amplitude range of said audio input signal comprising a bias network for producing an offset signal having a magnitude which serves to substantially center the duty cycle spread of at least said least significant bit in said digital output signal at fifty percent and an amplifier having associated therewith a gain which serves to restrict the duty cycle spread of at least said least significant bit in said digital output signal, said amplifier having said analog signal connected to its positive input thereof and said offset signal connected to its negative input thereof.

4,419,658

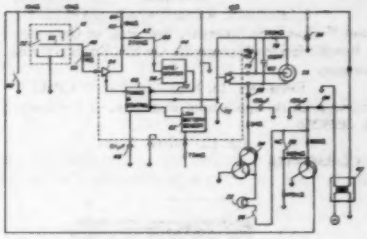
PORTABLE COMBINATION LAMP, SMOKE DETECTOR AND POWER FAILURE ALARM

Anthony M. Jarosz, Dracut, Mass., and Randy R. Stevens, Delray Beach, Fla., assignors to T. J. Company, Ayer, Mass.

Filed Apr. 1, 1981, Ser. No. 249,929

Int. Cl.³ G08B *19/00, 23/00*

U.S. Cl. 340—521 **4 Claims**



1. A portable personal warning device adapted to detect smoke or power failure, comprising in combination:

(a) a small portable housing;

(b) a lamp and a reflector mounted to said housing and directed outwardly from one side thereof;

(c) a smoke detector mounted in said housing and in communication with ambient air;

(d) audible alarm means operatively connected to said smoke detector and responsive thereto;

(e) a continuous power interruption detecting means mounted in said housing and connectable to available AC power;

(f) DC power storage means mounted in said housing, including battery recharging means for recharging said DC power storage means;

(g) circuit means connected to said lamp, said smoke detector, said audible alarm means, said power interruption detecting means and said DC power storage means;

(h) control means connected to said circuit means for actuating said lamp and said audible alarm means in the event of an interruption of AC power or smoke detected by said detector; and

(i) low and continuous DC power sensing means connected to said DC power storage means and to said circuit means and to said audible alarm means for actuating said audible alarm means in the event of low DC power.

4,419,659

INTRUSION DETECTION SYSTEM USING LEAKY TRANSMISSION LINES

Robert K. Harman, Kanata; Ronald W. Clifton, Nepean, and Russell E. Patterson, Ottawa, all of Canada, assignors to Control Data Canada, Ltd., Ottawa, Canada

Filed Jul. 14, 1981, Ser. No. 283,314

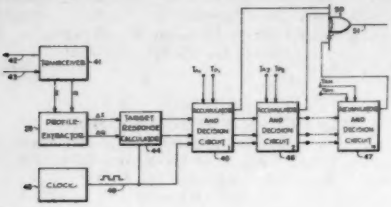
Claims priority, application Canada, Apr. 16, 1981, 375684

Int. Cl.³ G08B *13/24*

U.S. Cl. 340—552 **17 Claims**

1. An intrusion detection system comprising an antenna located within the perimeter of an area to be protectd, a leaky transmission line extending around the perimeter so that the presence of an intruder alters the electromagnetic coupling between the antenna and transmission line, an RF transmitter coupled to one of the antenna and transmission line and a receiver coupled to the other, means detecting incremental

changes in the in-phase and quadrature components of signals received at said receiver and means separately measuring and



accumulating magnitude and phase angle of said incremental changes to track and indicate the presence of an intruder.

4,419,660

ELECTRIC FILTER EQUIPMENT

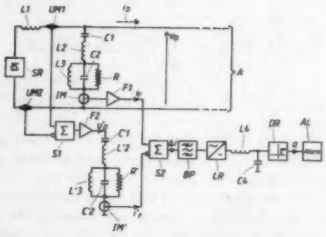
Bernt Bergdahl, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 16, 1981, Ser. No. 274,140

Claims priority, application Sweden, Jul. 8, 1980, 8005008

Int. Cl.³ G08B 21/00; H03H 7/10

U.S. Cl. 340—653 **6 Claims**



1. In an HVDC converter plant having a pair of DC voltage output lines, a harmonic filter comprising:

a main electrical harmonic filter connected between said output lines for suppressing harmonic signals;

a model filter having a filter structure and frequency response substantially the same as said main electrical harmonic filter, and a power handling ability substantially less than said main electrical harmonic filter, said model filter connected to receive a fractional representative portion of the voltage on said output lines;

means connected to structurally corresponding portions of said filters for providing first and second currents representing currents flowing through each of said filters; and

means for sensing a difference between said first and second currents, said means generating an indicating signal when said difference changes whereby an unacceptable change in said main electrical filter is detected.

4,419,661

DUAL CATHODE-RAY TUBE DISPLAY SYSTEM FOR TEXT EDITING

Seiji Hetsugi, Kawasaki, Japan, assignor to New Nippon Electric Co., Ltd., Kanagawa, Japan

Filed Jul. 3, 1980, Ser. No. 165,826

Claims priority, application Japan, Jul. 4, 1979, 54-84818; Jul. 4, 1979, 54-84819; Jul. 4, 1979, 54-84820; Jul. 4, 1979, 54-84821

Int. Cl.³ G09G 1/16

U.S. Cl. 340—707 **14 Claims**

1. A cathode-ray tube display device in which scanning lines are divided into a number of picture elements, the brightness of each picture element is controlled, and an image of characters, figures or the like is displayed on the screen thereof in a plurality of picture element matrices extending vertically and horizontally comprising:

a first cathode-ray tube;

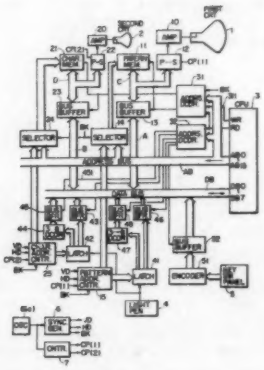
means for raster scanning said first cathode-ray tube;

first memory means including a first memory having addresses corresponding to addresses of picture elements on the screen of said first cathode-ray tube, said first memory storing data to be displayed on the screen of said first cathode-ray tube, said first memory means reading said first memory in synchronization with raster scanning of said first cathode-ray tube to display the data stored in said first memory on the screen of said first cathode-ray tube;

a second cathode-ray tube;

means for scanning said second cathode-ray tube in synchronization with the raster scanning of said first cathode-ray tube;

second memory means including a second memory having addresses corresponding to addresses of picture elements in a block obtained by dividing picture elements on the



screen of said first cathode-ray tube into a plurality of blocks each including a predetermined number of picture elements, said second memory means reading said second memory in synchronization with the raster scanning of said first cathode-ray tube wherein the data for a block stored in said second memory is displayed on the screen of said second cathode-ray tube;

first position discriminating means including a light pen having a tip adapted to be applied to the screen of said first and second cathode-ray tubes to detect raster light and for outputting position data representative of the position of said tip of said light pen on the screen of one of said first and second cathode-ray tubes;

second position discriminating means for discriminating among said plurality of blocks by dividing all of the picture elements on the screen of said first cathode-ray tube in one block to which said position data outputted by said first position discriminating means belongs to output block position data; and

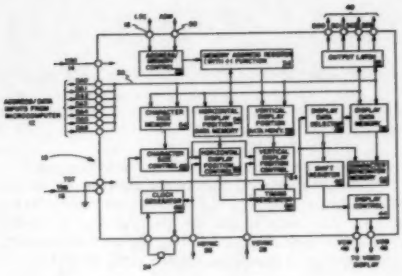
transferring means for transferring the picture element data for one block between said first and second memory means.

4,419,662

CHARACTER GENERATOR WITH LATCHED OUTPUTS

Jeffery A. Puskas, Prospect Heights; Peter C. Skerlos, Arlington Heights, and Thomas J. Zato, Palatine, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed May 4, 1981, Ser. No. 260,639
Int. Cl.³ G09G 1/16
U.S. Cl. 340—750 6 Claims



1. A system for converting a plurality of parallel output signals representing video information from a microcomputer into latched control signals and characters for presentation in a dot matrix form on the display face of a cathode ray tube in a television receiver, wherein ordered character display positions are scanned in successive lines on said display face with said microcomputer output signals including character code signals, memory address code signals and timing pulse signals, said system comprising:

bus means for receiving said plurality of microcomputer parallel output signals and for converting said signals into a series of coded digital signals;

first memory means coupled to said bus means for sequentially storing data representative of said control signals and said characters in a plurality of addressable memory locations, the spatial position of each of said memory locations corresponding to the positions of said characters as displayed on the face of said cathode ray tube;

address register means coupled to said bus means and responsive to said timing pulse signals for providing said memory address code signals to said first memory means when a first edge of said timing pulse signal is received by said bus means and for providing said character code signals to said first memory means for storage therein when a second edge of said timing pulse signal is received by said bus means;

second memory means adapted to store dot matrix images representing said characters in a plurality of addressable memory locations therein;

control means coupled to said second memory means and said first memory means for selecting and reading out particular ones of said dot matrix images from said second memory means according to the sequential storage of said characters in said first memory means and for providing said dot matrix images to said cathode ray tube; and

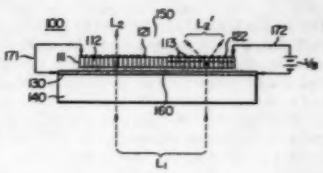
latch means including a plurality of latches coupled to said bus means for receiving said coded digital signals and for converting said coded digital signals to a plurality of latched output control signals for controlling video and nonvideo functions in said television receiver in response to the video information received from said microcomputer.

4,419,663

DISPLAY DEVICE

Tadao Kohashi, Moriguchi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 7, 1980, Ser. No. 128,039
Claims priority, application Japan, Mar. 14, 1979, 54-30363; Mar. 14, 1979, 54-30364; Nov. 7, 1979, 54-144617
Int. Cl.³ G09G 3/34
U.S. Cl. 340—783 115 Claims



1. A display device for controlling a display of light comprising:

a composite body including a porous substance member and liquid material impregnated in said porous substance member, said liquid material having an index of refraction substantially equal to the index of refraction of said porous substance member and having a resistivity selected to permit the operation of said display device;

at least one first eletrode disposed proximate a surface of said composite body;

at least one second electrode disposed proximate a surface of said composite body; and

means for applying a signal voltage between said first and second electrodes to move the liquid material in the porous substance member,

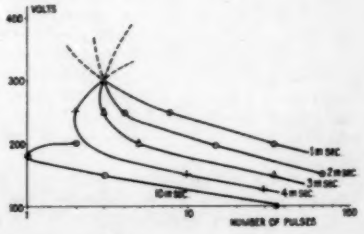
whereby the liquid impregnation factor of the porous substance member is controlled by the movement of the liquid material in the porous substance member in response to the signal voltage to control the display of light.

4,419,664

CO-ORDINATE ADDRESSING OF SMECTIC DISPLAY CELLS

William A. Crossland, Harlow; David Coates, and Peter J. Ayliffe, both of Bishop's Stortford, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 23, 1980, Ser. No. 219,559
Claims priority, application United Kingdom, Jan. 16, 1980, 8001499
Int. Cl.³ G09G 3/36
U.S. Cl. 340—784 14 Claims



1. A method of co-ordinate matrix addressing in internally electroded liquid crystal display cell which has a layer of smectic material sandwiched between two electroded plates crossing over a second array on the other plate defining therebetween a set of elemental volumes of liquid crystal each

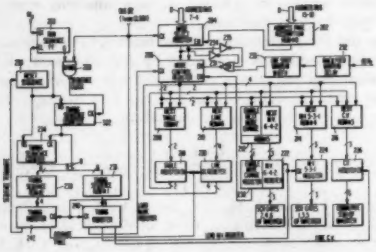
element of which is defined by the thickness of the liquid crystal layer and the area of overlap where a member of the first array crosses over a member of the second, wherein the smectic material exhibits positive dielectric anisotropy and has an electrical conductivity large enough for dynamic scattering to be capable of being produced by the application of an electric field across the layer, and wherein at least one of the plates is transparent and its surface in contact with the liquid crystal layer is such that, when the layer is taken into a smectic phase from less-ordered non-smectic phase by cooling in the absence of an applied field, those molecules of the layer adjacent said surface are caused to assume substantially homeotropic alignment, which method includes the steps of applying an electric potential between the members of the first array and those of the second in such a way as to cause dynamic scattering in said set of elemental volumes, converting the dynamic scattering in the set of elemental volumes into static focal-conic scattering by removal of said potential, and selectively restoring individual elemental volumes to non-scattering substantially homeotropically aligned state by the concurrent application of direct voltage signals of predetermined durations and magnitudes to selected electrodes in said arrays such that not more than ten direct voltage resultant switching pulses are applied between the two electrodes defining any elemental volume.

4,419,665

SYSTEM FOR CONTROLLING POWER DISTRIBUTION TO CUSTOMER LOADS

George P. Gurr, Dunwoody, and Bruce J. Nelson, Lilburn, both of Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.

Division of Ser. No. 53,710, Jul. 2, 1979, Pat. No. 4,348,668.
This application Aug. 6, 1982, Ser. No. 406,037
Int. Cl.³ H04Q *9/00*; H04B *3/54*
U.S. Cl. 340—825.06 **8 Claims**



1. In a system for controlling power distribution from a plurality of utility substations to a plurality of loads wherein a master control station under the control of an operator is in two-way communication with a plurality of microprocessor controlled substation injection units located respectively at said plurality of substations, a method of injecting a pulse code signal representing the desired control command onto the utility's power lines for transmission to receivers at said loads, comprising the steps of:

(a) transmitting a first binary injection message representing said desired control command from said master control station to each of said plurality of substation injection units in turn;

(b) transmitting a second binary injection message representing said desired control command received in step (a) from each of said substation injection units in turn to said master control station;

(c) verifying at said master control station that said second binary message is the same as said first binary message;

(d) transmitting a binary commence keying command signal from said master control station to all of said substation injection units simultaneously;

(e) generating a pulse code signal representing said first binary injection message at each of said substation injection units verified by step (c); and

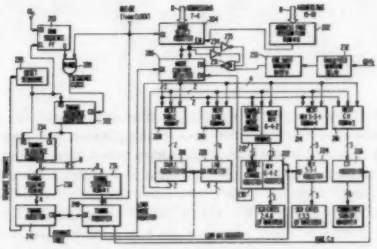
(f) injecting said pulse code signal generated in step (e) onto the utility's power lines for transmission to a plurality of coded receiver units remotely located at said loads to effect said desired control command.

4,419,666

SYSTEM FOR CONTROLLING POWER DISTRIBUTION TO CUSTOMER LOADS

George P. Gurr, Dunwoody, and Bruce J. Nelson, Lilburn, both of Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.

Division of Ser. No. 53,710, Jul. 2, 1979, Pat. No. 4,348,668.
This application Aug. 6, 1982, Ser. No. 406,038
Int. Cl.³ H04Q *9/00*; H02J *3/10*; H04B *3/54*
U.S. Cl. 340—825.06 **5 Claims**



1. A system for permitting an electric power utility to control the distribution of its three-phase, AC high voltage power along its power lines from a plurality of substations to a plurality of customer loads arranged in groups, which comprises:

a master control station including first programmable digital data processor means and input/output devices under the control of an operator for generating data signals in response to group control command signals;

a plurality of substation injection units in two-way communication with said master control station, each of said units located at a different one of said substations and having its own programmable digital data processor means, each of said substation injection units responsive to said data signals for generating pulse code signals for injection onto said power lines; and

a plurality of remote receiver units each located at and connected to control one of said customer loads and responsive to a particular one of said pulse code signals for connecting or disconnecting its load from said power lines; and

wherein said master control station includes:

means for polling each of said substation injection units to obtain information pertaining to its status, possible alarm conditions, and analog or discrete data generated at the respective substation;

means for transmitting and receiving serial binary block messages to and from each of said substation injection units, said block messages including substation injection unit address data, substation injection unit function commands and said data signals; and

means for prioritizing and executing said group control commands.

4,419,667

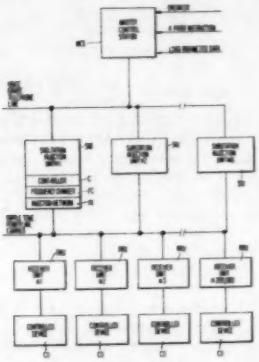
SYSTEM FOR CONTROLLING POWER DISTRIBUTION TO CUSTOMER LOADS

George P. Gurr, Dunwoody, and Bruce J. Nelson, Lilburn, both of Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.

Division of Ser. No. 53,710, Jul. 2, 1979, Pat. No. 4,348,668. This application Aug. 6, 1982, Ser. No. 406,094

Int. Cl.³ H04Q *9/00*; H04B *3/54*

U.S. Cl. 340—825.06 1 Claim



1. A system for permitting an electric power utility to control the distribution of its power along its power lines from a substation to a plurality of customer loads, which comprises:

a master control station including first programmable digital data processor means and input/output devices under the control of an operator for generating master control signals;

at least one substation injection unit located at said substation in communication with said master control station and operating under the control of second programmable digital data processor means for injecting, in response to certain of said master control signals, pulse code signals onto said power lines; and

a plurality of remote receiver units each connected to a particular load device and to said power lines for receiving said pulse code signals, each of said remote receiver units responsive to one of said pulse code signals for connecting or disconnecting its load from said power lines; and

wherein said substation injection unit further comprises:

means for converting the frequency of a standard three-phase power line voltage signal generated by said utility at said substation to a preselected frequency desired for said pulse code signals;

means responsive to said second data processor means for controlling the output of said frequency converting means to generate said pulse code signals; and

means for injecting said pulse code signals onto said power lines for transmission to said remote receiver units; and

wherein said frequency converting means comprises:

three-phase rectifier means including a plurality of conduction controlled solid state devices under the control of said second data processor means for receiving said three-phase power line voltage signal and for developing a DC voltage signal of a predetermined level; and

three-phase inverter means including a plurality of conduction controlled solid state devices under the control of said second data processor means for receiving said DC voltage signal from said rectifier means and for converting same to said pulse code signal at said preselected frequency; and

wherein said substation injection unit further comprises:

means connected to said power lines for detecting each pulse in said pulse code signals; and

means in said second data processor means for determining whether the outputs of said pulse detecting means consist of a properly timed pulse.

4,419,668

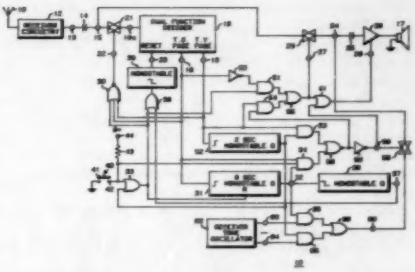
COMBINED TONE ONLY AND TONE VOICE MULTIPLE ALERT PAGER

Charles J. Ganucheau, Jr., North Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 25, 1981, Ser. No. 305,571

Int. Cl.³ G08B *5/22*

U.S. Cl. 340—825.44 15 Claims



1. A combined tone only and tone and voice multiple alert pager comprising:

paging receiver means for receiving signals and searching for predetermined signal codes in said received signals, said receiver means also providing received audio signals corresponding to audio frequency information received by said receiver means, said receiver means including an audio transducer means for selectively providing various audible alerts in response to the reception of said predetermined signal codes,

said receiver means including,

tone only alert means for implementing a tone only alert mode in response to said receiver means receiving a first predetermined signal code, and for providing during said tone only mode, by coupling signals to said audio transducer means, a tone only first audible alert comprising at least a first audible alert tone signal having a first predetermined time duration, and

tone and voice alert means for implementing a tone and voice alert mode in response to said receiver means receiving a second predetermined signal code, and for providing during said tone and voice mode, by coupling signals to said audio transducer means, a second audible alert comprising at least a second audible alert tone signal having a second predetermined time duration followed by audible signals corresponding to audio frequency information received by said receiver means after said second predetermined signal code;

switch means, separate from said tone only alert means and said tone and voice alert means, coupled to said receiver means for normally, in response to actuation/deactuation of said switch means, coupling said received audio signals corresponding to audio frequency information received by said receiver means to said audio transducer means for audible reproduction thereby; and

means for terminating said tone only and tone and voice modes,

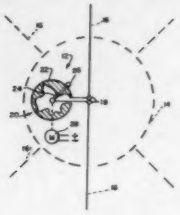
wherein said tone only alert means includes received audio inhibit means enabled in response to the creation of said tone only mode by the reception of said first predetermined signal code, for inhibiting, during said tone only alert mode, any coupling of said received audio signals to said audio transducer means by said actuation/deactuation of said switch means.

4,419,669

CONTROLLED SCINTILLATION RATE DECOY

Donald M. Slager, Long Beach, and William C. Barker, Pacific Palisades, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 4, 1971, Ser. No. 103,906
Int. Cl.³ H01Q 15/14; G01S 7/38
U.S. Cl. 343—18 D 10 Claims



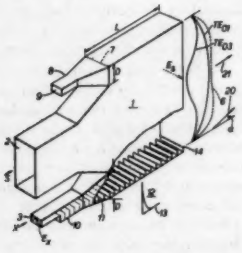
1. A controlled scintillation radar decoy comprising;
a decoy body;
microwave reflectors mounted on said body for reflecting incident radar energy in a manner to simulate the radar cross-section of a larger space vehicle to be protected; and
means for varying the reflectivity of said reflectors in random manner and at a relatively slow rate in such a way as to introduce into radar energy reflecting from the decoy a randomly varying scintillation effect simulating the varying scintillation of said space vehicle.

4,419,670

DUAL FEED BOX HORN ANTENNA

Stewart C. Hill, Leicester, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Nov. 12, 1981, Ser. No. 320,684
Claims priority, application United Kingdom, Nov. 13, 1980, 8036535
Int. Cl.³ H01Q 25/00, 19/17
U.S. Cl. 343—779 6 Claims



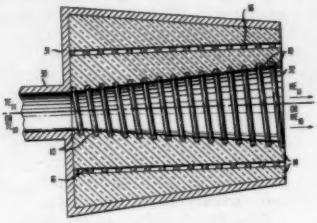
1. An antenna including a reflector and a box horn positioned at a focus of said reflector so as to illuminate it, the body of the box horn being dimensioned to support the TE_{01} and TE_{03} modes of a signal applied to a first input port thereof and to direct the resultant signal towards said reflector; and a second input port off-set from the axis of the box horn and being arranged to accept a higher frequency than said first port, one wall of the box horn being arranged to launch said higher frequency as a surface wave directed towards said reflector.

4,419,671

SMALL DUAL FREQUENCY BAND HYBRID MODE FEED

Anthony R. Noerpel, Long Branch, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 28, 1981, Ser. No. 315,619
Int. Cl.³ H10Q 13/02
U.S. Cl. 343—786 3 Claims



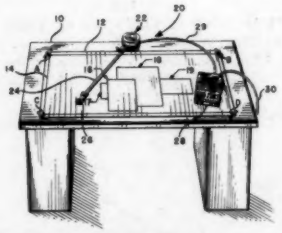
1. A dual frequency band, hybrid mode feed comprising:
a hollow waveguide body (12) comprising an inner surface; and
a helically wound wire structure (10) bonded to the inner surface of the waveguide body with a dielectric layer (14) having a predetermined thickness which permits a predetermined mode to propagate at a first frequency band; and
a periodic tuned grid structure (16) which is embedded in the dielectric layer between the helically wound wire structure and the inner surface of the waveguide body at a predetermined depth from the helically wound wire structure to permit said predetermined mode to propagate at a second frequency band.

4,419,672

POINT LOCATOR AND GRAPHICS DIGITIZER SYSTEM

Edwin A. Hird, 10200 DeSoto Ave., #331, Chatsworth, Calif. 91311

Filed Apr. 1, 1977, Ser. No. 783,608
Int. Cl.³ G01D 5/16
U.S. Cl. 346—33 M 28 Claims



1. A point locator system comprising:
a housing and a movable cursor, the housing including a base portion having means for mounting the base in a selected position along a generally planar surface and a second portion movable relative to the base in response to the positioning of the cursor;
a thin band, curved in cross-section, coupling the cursor to the housing and being movable relative to the base portion of the housing;
means fixedly mounting the cursor to the distal end of the band;
a first potentiometer mounted within the housing and being connected across a voltage source and including a movable arm coupled to respond to movement of the band

along one coordinate of a coordinate system capable of mathematically specifying the location of a selected point on said surface, said movable arm thereby generating a first signal representative of the position of the cursor along said one coordinate;

a second potentiometer mounted within the housing and being connected across a voltage source and including a movable arm coupled to respond to movement of the band along an other coordinate of a coordinate system capable of mathematically specifying the location of a selected point on said surface, said movable arm thereby generating a second signal representative of the position of the cursor along said other coordinate; and

means for receiving said first and second signals for recording thereof.

4,419,673

INK DROPLET EJECTION SYSTEM

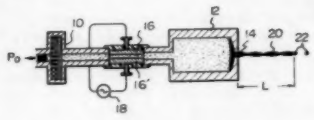
Yutaka Ebi, and Akinori Mizuno, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 2, 1981, Ser. No. 308,019

Claims priority, application Japan, Oct. 10, 1980, 55-141608

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **7 Claims**



1. A fluid droplet ejection system comprising:

a fluid inlet passageway supplied with fluid under pressure;

a fluid ejection head having a nozzle communicated with the inlet passageway for ejecting a stream of the fluid from the nozzle; and

electric field applying means for periodically applying an electric field to the fluid in the inlet passageway to thereby separate the stream of the fluid from the nozzle into successive droplets;

the electric field being applied to the fluid in a direction perpendicular to an intended direction of fluid flow.

4,419,674

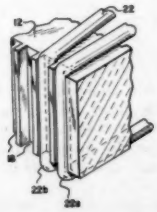
WIRE WOUND FLAT-FACED CHARGE PLATE

Surinder K. Bahl; Margene C. Howell, and Loy D. Pace, all of Dayton, Ohio, assignors to Mead Corporation, Dayton, Ohio

Filed Feb. 12, 1982, Ser. No. 348,476

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **13 Claims**



1. A planar-faced charge plate structure comprising,

an electrically nonconductive substrate having an upper and a lower surface, and at least one end face normal to said upper surface,

a plurality of electrically conductive wires extending across at least said upper surface and said end face of said substrate, and

means for securing said wires to said substrate,

the outwardly facing surfaces of said wires along said end face of said substrate being in parallel, spaced coplanar relationship with each other and with said end face and forming charge electrodes.

4,419,675

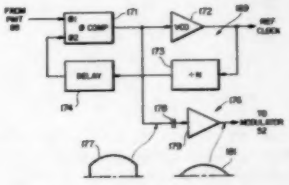
IMAGING SYSTEM AND METHOD FOR PRINTED CIRCUIT ARTWORK AND THE LIKE

Don B. Neumann, Laguna Beach; Lyle K. Norton, Santa Ana, and Eric V. Olson, Long Beach, all of Calif., assignors to American Hoechst Corporation, Somerville, N.J.

Filed May 24, 1979, Ser. No. 42,133

Int. Cl.³ G01D *9/42*; H04N *1/22*; G03B *41/00*

U.S. Cl. 346—108 **4 Claims**



1. In a system for use in the manufacture of printed circuit boards: a source of data representative of artwork to be formed on the circuit boards, laser means for providing a beam of coherent radiation, means for modulating the beam in accordance with the data, means for holding an output medium in position to be scanned by the beam, means for effecting scanning of the output medium by the modulated beam to form an image of the artwork on the output beam, means for sensing the position of the beam and providing a reference signal corresponding to the position of the beam on the output medium, means responsive to the reference signal for synchronizing the modulation of the beam with the position of the beam on the output medium, and means for shifting the phase of the reference signal forward in time to compensate for any delay between the generation of the reference signal and the arrival of the modulated beam on the output medium.

2. In a method utilizing a laser beam to produce artwork for printed circuit boards, the steps of: providing data signals defining the artwork to be produced, modulating the laser beam in accordance with the data signals, scanning the modulated laser beam across an output medium to form an image of the artwork on the output medium, monitoring the position of the beam and providing a reference signal corresponding to the position of the beam on the output medium, synchronizing the modulation of the beam in accordance with the reference signal, and shifting the phase of the reference signal forward in time to compensate for any delay between the generation of the reference signal and the arrival of the modulated beam on the output medium.

4,419,676

METHOD OF RECORDING SIGNALS ON BANDS BY MEANS OF LASER BEAMS AND APPARATUS FOR CARRYING OUT THE METHOD

Attila Markus Lenk; Andras Podmaniczky, and Szabolcs Tokes, all of Budapest, Hungary, assignors to Magyar Tudományos Akadémia Számitastechnikai és Automatizálasi Kutató Intézete, Budapest, Hungary

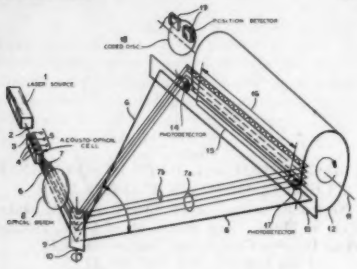
PCT No. PCT/HU80/00009, § 371 Date Aug. 11, 1981, § 102(e) Date Aug. 11, 1981, PCT Pub. No. WO81/01767, PCT Pub. Date Jun. 25, 1981

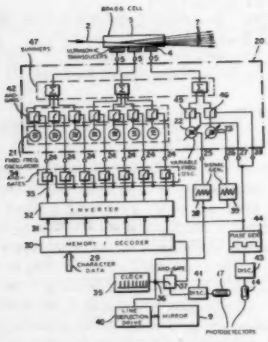
PCT Filed Dec. 11, 1980, Ser. No. 293,202

Claims priority, application Hungary, Dec. 18, 1979, 3252

Int. Cl.³ G01D *9/42*

U.S. Cl. 346—108 12 Claims





1. In a method of recording signals on a band by means of laser means, comprising the steps of projecting a plurality of character recording laser beams propagating in a common plane onto a recording surface, deflecting said beams to scan respective raster lines on discrete recording bands of said surface, generating said character recording laser beams simultaneously in each recording point of each band in accordance with the shape of the character signal falling on the corresponding points. Wherein the improvement is that said recording surface is illuminated by means of said character recording laser beams only in locations that do not comprise any character, the passage of said character recording laser beams towards locations of said recording surface that comprise characters or signals is blocked, at least one band gap illuminating laser beam in addition to the recording laser beams is generated to propagate together and in a common plane therewith, and the band gaps of the recording surface are illuminated by said band gap illuminating laser beams.

4,419,677

INK JET RECORDING APPARATUS

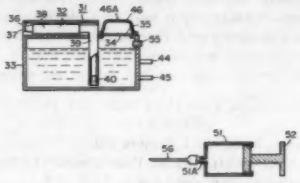
Yukio Kasugayama, Yokohama; Koji Terasawa, Fuchu, and Yoshihumi Hattori, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 195,354, Oct. 9, 1980, abandoned. This application Nov. 24, 1982, Ser. No. 444,216

Claims priority, application Japan, Oct. 17, 1979, 54-132825

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R 3 Claims



1. A compact ink jet recording apparatus comprising:

a compact recording liquid container having an elastic plug provided in an aperture formed in a wall of said container, wherein said plug prevents escape of recording liquid from said container;

a recording head integral with said container for effecting printing, while moving longitudinally along printing paper, by discharging recording liquid supplied from said container;

a vent;

a vent filter mounted above the vent, for preventing the passage of the recording liquid while permitting the passage of gases therethrough;

pressurizing means provided above said vent filter, to manually apply pressure to the interior of said recording liquid container through said vent filter; and

a recording liquid supply device including:

a cylindrical supply body for storing recording liquid therein;

a piston member fitted to said body for manually changing volume of the recording liquid stored in said body;

and

a ink supply member mounted to said body for communicating with the interior of said body.

4,419,678

INK JET RECORDING APPARATUS

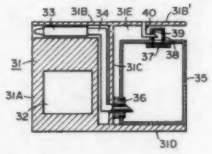
Yukio Kasugayama, Yokohama; Koji Terasawa, Fuchu, and Yoshihumi Hattori, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,350

Claims priority, application Japan, Oct. 17, 1979, 54-132824

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R 3 Claims



1. An ink jet recording apparatus comprising:

recording means for discharging recording liquid in response to an electrical signal;

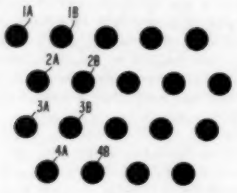
a supply tube, having a tip end, for feeding the recording liquid to said recording means; and

recording liquid reservoir means for storing the recording liquid therein, said reservoir means comprising a wall surface, a first elastic blind portion provided in said wall surface for receiving said tip end of said supply tube for insertion thereinto, an atmosphere communicating member, and a second elastic blind portion provided in said wall surface for receiving said atmosphere communicating member for insertion thereinto to communicate between the interior of said reservoir means and the atmosphere, and upon said atmosphere communicating member being inserted into said second blind position, said reservoir means further comprising two chambers for preventing leakage of the recording liquid to the outside thereof.

4,419,679
GUADRASCAN STYLI FOR USE IN STAGGERED RECORDING HEAD

Sherman L. Rutherford, Portola Valley; Arthur E. Bliss, Sunnyvale, and Noel J. Schmidt, Palo Alto, all of Calif., assignors to Benson, Inc., San Jose, Calif.

Filed Jun. 3, 1980, Ser. No. 155,937
Int. Cl.³ G01D *15/06*; G03G *15/44*
U.S. Cl. 346—155 **8 Claims**

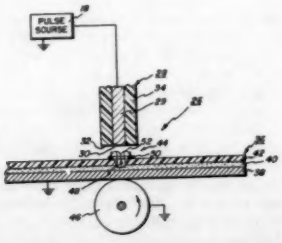


1. A recording head comprising four staggered rows of styli wherein the styli in each row are spaced two styli diameters apart center-to-center, each styli having a substantially circular cross-section, each row being separated from the adjacent row by a distance in excess of the diameter of each styli and each row being staggered relative to the adjacent row or rows by at least one-half diameter of the styli, and wherein the second row of styli is staggered by one styli diameter relative to the first row, the third row of styli is staggered by one-half styli diameter relative to the first row, and the fourth row of styli is staggered by one styli diameter relative to the third row and one-half styli diameter relative to the second row.

4,419,680
ELECTROGRAPHIC PRINTING SYSTEM

Nicholas K. Sheridon, Saratoga; David K. Biegelsen, and Michael A. Berkovitz, both of Woodside, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 7, 1980, Ser. No. 166,219
Int. Cl.³ G01D *15/08*
U.S. Cl. 346—163 **17 Claims**



1. An electrographic printing system wherein printing is accomplished in a recording gap between oppositely opposed electrode means between which a recording medium is transposed comprising

print electrode means comprising at least one print electrode and a dielectric collar surrounding the print end portion of said print electrode,

a thin dielectric layer forming a part of said recording medium and facing said print electrode means,

the end portion of said print electrode and the end surface of said collar being substantially flush and disposed adjacent to said dielectric layer,

complement electrode means positioned for conducting current through said recording medium via said print electrode means,

a conductive solid pigment medium being a constituent of said complement electrode means,

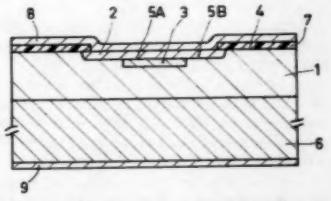
circuit means connected to apply a potential difference between said print and complement electrode means to induce current flow and discharge therebetween sufficient to create an aperture in said dielectric layer and the erosion of a minute portion of said pigment medium therethrough whereby a pigment particle aerosol is created between said print electrode means and said dielectric layer,

said dielectric collar contributing to the local confinement and dwell period of said aerosol at the lip of said aperture to permit the deposition of said particles therefrom on said dielectric layer substantially in the form of a torus around said aperture lip thereby optimizing the confinement and ultimate resolution of formed pigment marks on said recording medium.

4,419,681
ZENER DIODE

Albert Schmitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 18, 1980, Ser. No. 188,198
Claims priority, application Netherlands, Oct. 18, 1979, 7907680
Int. Cl.³ H01L *27/70*
U.S. Cl. 357—13 **10 Claims**



1. A semiconductor device having a Zener diode comprising a semiconductor body having

a highly doped substrate layer of a first conductivity type,

a first semiconductor region of an epitaxial layer extending from said substrate layer to a surface of said body and also being of said first conductivity type, said epitaxial layer having a thickness of at least 10 μm and at most 35 μm, and a resistivity of at least 0.5 Ohm cm and at most 2 Ohm cm to provide a positive differential resistance upon breakdown, and said substrate layer having a higher doping concentration than said epitaxial layer,

a second semiconductor region of a second conductivity type situated within said first semiconductor region, said second semiconductor region also adjoining said surface,

a third semiconductor region of said first conductivity type disposed at a distance from said surface in said first semiconductor region and bounded by said second semiconductor region, said third semiconductor region having a

higher doping concentration than said first semiconductor region, said third semiconductor region in projection being entirely situated within said second semiconductor region, said third semiconductor region containing the depletion zone at breakdown, and said second semiconductor region having a higher doping concentration than said third semiconductor region, and

a p-n junction between said second semiconductor region and said first and third semiconductor regions and extending substantially parallel to said surface but terminating at said surface.

4,419,682

THREE LEVEL POLY DYNAMIC RAM WITH POLY BIT LINES

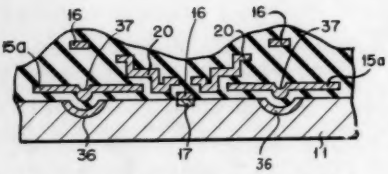
Fujio Masuoka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 23, 1981, Ser. No. 227,936

Claims priority, application Japan, Jan. 25, 1980, 55-7519; Jan. 25, 1980, 55-7520; Jan. 25, 1980, 55-7524

Int. Cl.³ H01L *27/10, 23/50;* G11C *11/40*

U.S. Cl. 357—23 **4 Claims**



1. A semiconductor memory device comprising:

a. a semiconductor substrate of a first conductivity type having selectively formed therein a plurality of recesses;

b. field inversion preventive regions selectively formed in said recesses in said semiconductor substrate;

c. field inversion regions formed at both sides of said field inversion preventive regions;

d. a first insulative layer of substantially constant thickness formed on said semiconductor substrate and having a plurality of openings;

e. first polycrystalline silicon layers insulatively disposed over said field inversion preventive layers and said field inversion layers upon said first insulative layer, said first polycrystalline silicon layers forming capacitors in cooperation with said field inversion layers;

f. second insulative layers formed on said first polycrystalline silicon layers;

g. second polycrystalline silicon layers alternately disposed on said second insulative layers and on parts of said semiconductor substrate which are exposed through said openings in said first insulative layer, said second polycrystalline silicon layers functioning as digit lines;

h. regions of a second conductivity type formed at parts of said semiconductor substrate which are in contact with said second polycrystalline silicon layers;

i. third polycrystalline silicon layers insulatively disposed over said semiconductor substrate between said first polycrystalline silicon layers and said second polycrystalline silicon layers, said third polycrystalline layers functioning as gates of MOS transistors; and

j. a third insulative layer disposed as a gate oxide film for insulating said third polycrystalline silicon layers from said substrate, said second insulative layers being more than twice as thick as said third insulative layer.

4,419,683

THYRISTOR HAVING A CONTROLLABLE EMITTER SHORT CIRCUIT

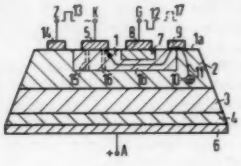
Helmut Herberg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,175

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018542

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **12 Claims**



1. In a semiconductor thyristor of the type wherein an outer n-emitter carries a first electrode, an outer p-emitter carries a second electrode, a p-base and an n-base are between and respectively adjacent the emitters, and a controllable emitter short circuit is provided, the improvement therein comprising:

a junction field effect transistor for controlling the emitter short circuit, said field effect transistor comprising

a semiconductor zone in one of the emitters doped opposite to that emitter,

a gate electrode carried on said zone,

a first portion of said one emitter below said zone constituting a channel zone for said field effect transistor and second and third portions of said one emitter constituting the drain and source of the field effect transistor,

the respective electrode contacting said second portion of said one emitter, and

a conductive coating connecting said third portion of said one emitter with the adjacent one of said bases.

4,419,684

SEMICONDUCTOR INTEGRATED CIRCUIT

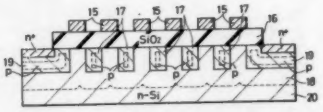
Yoshio Sakai, Hachioji, and Hideo Nakamura, Hinodemachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 14, 1981, Ser. No. 224,946

Claims priority, application Japan, Jan. 21, 1980, 55-4621

Int. Cl.³ H01L *27/04*

U.S. Cl. 357—40 **6 Claims**



1. A semiconductor integrated circuit device comprising:

a semiconductor body of a first conductivity type;

an insulating layer disposed on a major surface of said semiconductor body;

an interconnection layer disposed on said insulating layer so as to overlie a first portion of said semiconductor body, which first portion comprises a surface portion at said major surface and an interior portion formed in said semiconductor body under said surface portion, and wherein a series capacitance is formed of the capacitance across said insulating layer between said interconnection layer and said body and through a depletion layer formed in said body beneath said insulating layer, and

further including means for reducing said series capacitance

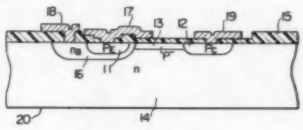
independently of the thickness of said insulating layer, wherein said reducing means includes means for increasing the depth of said depletion layer formed in said body, said means comprising a well-shaped semiconductor region of a second conductivity type, opposite said first conductivity type, formed to extend into said semiconductor body from said major surface thereof and forming a PN junction with said body, and means for biasing said PN junction so as to impart a depletion region from said well-shaped region into said interior portion of said first portion of said body beneath said interconnection layer, wherein said well-shaped region is disposed to at least partially surround said interior portion of said first portion on said major surface so that first and second regions of said well-shaped semiconductor region will face each other with said interior portion of said first portion being interposed between said first and second regions, and wherein said well-shaped semiconductor region contains semiconductor circuit elements therein.

4,419,685

SEMICONDUCTOR DEVICE

Yoshitaka Sugawara; Tatsuya Kamei, both of Hitachi, and Tetsuma Sakurai, Hachioji, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,510
Claims priority, application Japan, Mar. 19, 1980, 55/34066
Int. Cl.³ H01L *29/40*
U.S. Cl. 357—53 **3 Claims**



1. A semiconductor device comprising:

(a) a semiconductor substrate of a first conductivity type including a first semiconductor region of said first conductivity type exposed to one of the principal surfaces of said semiconductor substrate, said first semiconductor region having an impurity concentration higher than that of said semiconductor substrate, a second semiconductor region of a second conductivity type formed in said first semiconductor region to be exposed to said one principal surface, a third semiconductor region of said second conductivity type formed at a position spaced apart from said first semiconductor region to be exposed at said one principal surface, and a fourth semiconductor region of said second conductivity type formed between said first and third semiconductor regions to make contact therewith and to be exposed to said one principal surface, said fourth semiconductor region having an impurity concentration lower than that of said third semiconductor region;

(b) a passivation film covering said one principal surface of said semiconductor substrate; and

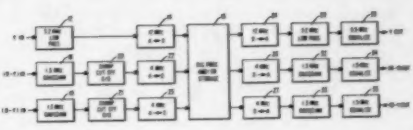
(c) first, second and third electrodes making ohmic contact with said first, second and third semiconductor regions through openings in said passivation film, respectively, said second electrode extending on said passivation film beyond a portion of said first semiconductor region between said second and fourth semiconductor regions and to a point on said passivation film under which said fourth semiconductor region exists, said first electrode being in ohmic contact with said first semiconductor region at a portion thereof remote from said fourth semiconductor region, and a portion of said third electrode remote from said first and second electrodes extending to a point on said passivation film under which said semiconductor substrate is exposed.

4,419,686

DIGITAL CHROMINANCE FILTER FOR DIGITAL COMPONENT TELEVISION SYSTEM

Eric F. Morrison, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Feb. 4, 1981, Ser. No. 231,278
Int. Cl.³ H04N *9/32*
U.S. Cl. 358—13 **13 Claims**



1. An apparatus for digitally filtering a digitized chrominance signal and a digital component television system comprising:

means for digitally computing at least one intermediate value between adjacent successive chrominance sampled values of said digitized chrominance signal, said intermediate value being determined from a functional relationship defined by a predetermined characteristic of said digitized chrominance signal; and

means for combining each said intermediate value with said chrominance sampled values to produce a digital chrominance signal of higher effective sampling rate.

4,419,687

COMPATIBLE COMPONENT DIGITAL SYSTEM

Robert A. Dischert, Burlington, and Charles B. Oakley, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 24, 1981, Ser. No. 276,958
Int. Cl.³ H04N *5/76, 9/32, 9/491*
U.S. Cl. 358—13 **13 Claims**

PIXEL NO.	1	2	3	4	
CHANNEL NO. 1	Y+I X	Y+Q X	Y−I X	Y−Q X	
2	Q Y−I	Q Y−Q	Q Y+I	Q Y+Q	

1. A method of transmitting samples of a color television signal, said method comprising sequentially transmitting in each of a plurality of channels a separable set of color component s of each sample of said television signal, samples in any one channel being cosited with respect to corresponding samples in the remaining channel or channels, any one channel of said plurality being separable with respect to the remaining channel or channels, whereby at least approximate separation into color components is possible when only one channel is available due to dropouts, and complete color separation is possible when all channels are available.

4,419,688
COLOR-TELEVISION RECEIVER WITH AT LEAST ONE DIGITAL INTEGRATED CIRCUIT FOR PROCESSING THE COMPOSITE COLOR SIGNAL

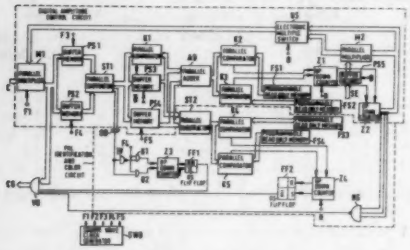
Leslie Miskin, Gundelfingen, and Peter M. Flamm, Freiburg, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,218

Claims priority, application European Pat. Off., Oct. 3, 1980, 80106654.9

Int. Cl.³ H04N 9/535, 9/49

U.S. Cl. 358—27 **8 Claims**



1. A color television receiver comprising:

a first digital circuit responsive to a received digital chrominance signal and a digital amplitude control signal produced automatically in said first digital circuit to control the amplitude of said received signal;

a second digital circuit coupled to given ones of a plurality of outputs of said first digital circuit to provide PAL identification and color killer action;

and

a third digital circuit coupled to another output of said plurality of outputs of said first digital circuit and given ones of a plurality of outputs of said second digital circuit to provide a controlled digital chrominance signal.

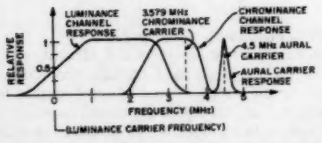
4,419,689
DIGITAL COLOR MODULATOR

Gilbert E. Russell, Hayward, and Hee Wong, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 216,470, Dec. 15, 1980, abandoned. This application Aug. 3, 1982, Ser. No. 404,801

Int. Cl.³ H04N 9/535

U.S. Cl. 358—37 **1 Claim**



1. Apparatus for precompensating a digital luminance signal representing a serial dot-by-dot video luminance for cross-modulation between the luminance and chrominance channels in NTSC receivers due to high-frequency digital transitions in the luminance signal, the apparatus comprising:

means for detecting, in the situation where two adjacent dark dots are preceeded by or followed by an adjacent light dot, the transition from a light to a dark dot or a dark to a light dot, as appropriate; and

means for increasing the luminance amplitude of the dark dot immediately adjacent the white dot.

4,419,690
METHOD AND APPARATUS FOR PRODUCING A HALF-TONE REPRODUCTION

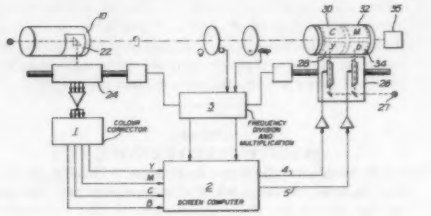
Philippe Hammes, Massy, France, assignor to Crosfield Electronics Limited, London, England

Filed Aug. 27, 1981, Ser. No. 296,670

Claims priority, application United Kingdom, Sep. 1, 1980, 8028176

Int. Cl.³ H04N 1/46

U.S. Cl. 358—75 **24 Claims**



1. A method of making a half-tone reproduction of an original image by exposing an output surface to a scanning beam which assumes conditions in accordance with the value of a control signal, comprising, for the generation of the control signal, the steps of:

(a) generating position signals representing the position of the scanning beam within a half-tone dot area of a screen grid, each successive position in the screen grid of the scanning beam being determined by the repeated addition of small increments to the previous position, and, at each successive position, the position signals being compared with a predetermined value to detect the crossing of the border of the dot area;

(b) comparing each of the position signals with a picture signal representing the picture density at the corresponding point of the original image to be reproduced; and

(c) combining the results of the comparisons to generate the control signal which causes the scanning beam to write on the output surface in accordance with the result of the combination of results.

4,419,691
METHOD FOR THE IMPROVED REPRODUCTION OF IMAGE IN REPRODUCTION TECHNOLOGY

Gerhard Sing, Schonkirchen, and Klaus Wellendorf, Kitzeberg b. Kiel, both of Fed. Rep. of Germany, assignors to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

PCT No. PCT/DE81/00016, § 371 Date Sep. 16, 1981, § 102(e) Date Sep. 16, 1981, PCT Pub. No. WO81/02206, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 17, 1981, Ser. No. 302,421

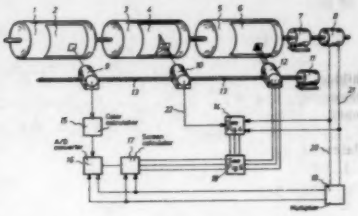
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002781

Int. Cl.³ H04N 1/40

U.S. Cl. 358—75 **4 Claims**

1. A method for combined reproduction of pictures and line drawings comprising the steps of optoelectronically scanning a picture original with a first scanning element and generating a first recording signal for the screened reproduction of said picture original, controlling a plurality of separately drivable recording beams by the first recording signal for forming raster dots for the screened reproduction of said picture original, said plurality of recording beams having a finer resolution than the scanning element, optoelectronically scanning a line drawing original with a second scanning element and generating a

second recording signal for a refined line reproduction of said line drawings and controlling said plurality of recording beams



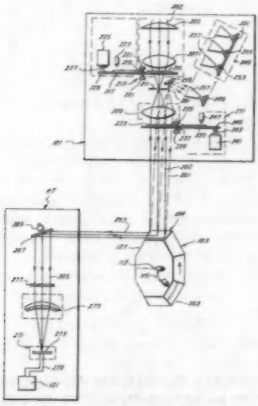
by the second recording signal, wherein for refined reproduction of said line drawing original the recording beams are individually controlled by the second recording signal.

4,419,692

HIGH SPEED INFRARED IMAGING SYSTEM

James E. Modisette, and Ralph B. Johnson, both of San Antonio, Tex., assignors to Texas Medical Instruments, Inc., San Antonio, Tex.

Filed Dec. 31, 1981, Ser. No. 336,088
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—113 **20 Claims**



1. A method of calibrating an imaging system having a plurality of detectors, comprising:

adjusting a slueable radiance source within about the range of radiance to be sensed by the imaging system,

sensing the slueable radiance with a plurality of detectors, and

clamping the output of each detector of said plurality to an internal reference.

4,419,693

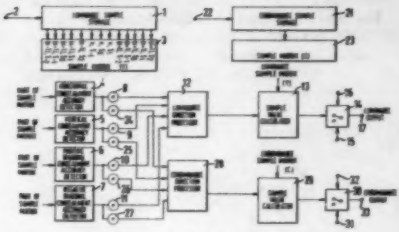
ERROR CONCEALMENT IN DIGITAL TELEVISION SIGNALS

James H. Wilkinson, Tadley, Near Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 248,861
Claims priority, application United Kingdom, Apr. 2, 1980, 8011090
Int. Cl.³ H04N *5/21*
U.S. Cl. 358—167 **14 Claims**

1. A method of concealing errors in a digital television signal, which television signal comprises a plurality of sample signals corresponding respectively to sample positions along a horizontal scan line of a television picture made up of a plurality of such lines, the method comprising, in respect of each said sample signal which is in error:

selecting from a plurality of algorithms a preferred algorithm for correcting such error sample signal;



calculating a corrected value of said error sample signal using said preferred algorithm;

substituting said corrected value of said error sample signal for said error sample signal so as to conceal the error; and

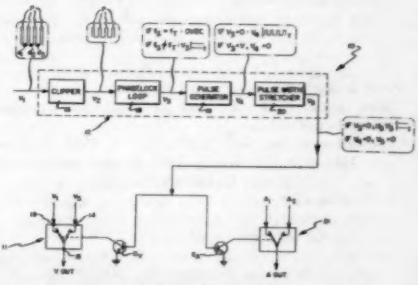
supplying said digital television signal having said corrected values of said error sample signal to an output for use in a television signal processing device.

4,419,694

FREQUENCY-SENSITIVE SWITCHING CIRCUIT AND METHOD

Friedrich Vesterling, Blasdell, N.Y., assignor to WNY Hospital Television, Inc., Buffalo, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,775
Int. Cl.³ H04N *5/44*
U.S. Cl. 358—181 **10 Claims**



1. A switching circuit, comprising:

a switch having a first input terminal adapted to be supplied with a first signal normally having a repetitious series of pulses, having a second input terminal adapted to be supplied with a second signal, and having an output terminal, said switch being operable in response to a command signal to electrically connect said output terminal alternatively with said first input terminal or with said second input terminal; and

a sampling circuit adapted to be supplied with said first signal and arranged to produce said command signal for operating said switch, said sampling circuit being arranged to sense the pulse frequency in said first signal and operable to connect said output and first input terminals whenever the sensed pulse frequency differs from a desired frequency by less than a known amount, and operable to connect said output and second input terminals

whenever the sensed pulse frequency differs from said desired frequency by more than said known amount; and

an isolation relay operatively arranged to interrupt the first signal supplied to said sampling circuit whenever the sensed pulse frequency differs from said desired frequency by more than said known amount.

4,419,695

TELEVISION SOUND RECEIVER

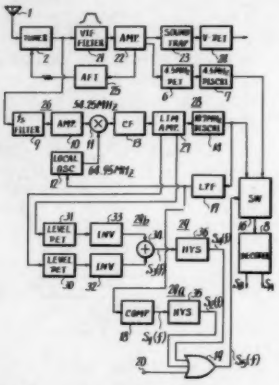
Yoshihiro Yamamoto, Tokyo; Masayuki Hongu, Kawasaki; Shigeru Ohmuro, Tokyo, and Hiromi Kawakami, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 21, 1982, Ser. No. 341,465

Claims priority, application Japan, Jan. 29, 1981, 56-12564

Int. Cl.³ H04N *5/60*

U.S. Cl. 358—198 **8 Claims**



1. A television receiver comprising:

input terminal means for receiving a modulated television sound signal having a frequency associated therewith;

tuning means for tuning said receiver to the frequency of said modulated television sound signal and providing a tuned output signal, said tuning means including a first oscillating means for producing an oscillating signal at an oscillating frequency;

intercarrier sound demodulating means for demodulating said tuned output signal and providing an intercarrier sound demodulating output signal;

split-carrier sound demodulating means for demodulating said tuned output signal and providing a split-carrier sound demodulating output signal and which includes a limiter amplifier having at least one output signal;

sound signal output terminal means;

switching means operable to select from said intercarrier and split-carrier sound demodulating output signals and to supply said selected signal to said sound signal output terminal means;

error detecting means for detecting frequency error in said oscillating frequency of said first oscillating means and providing an output signal;

first operational means for operating on said output signal of said error detecting means and providing a first operational output signal which has at least a high level and a low level;

level detecting means for detecting said at least one output signal of said limiter amplifier and providing a level detected output signal; and

second operational means for operating on said level detected output signal and providing a second operational output signal which has at least a high level and a low level; whereby said signal selected by said switching means and supplied to said sound signal output terminal means is selected in accordance with the level of said output signal of said first operational means and the level of said output signal of said second operational means.

4,419,696

ELONGATE THIN-FILM READER

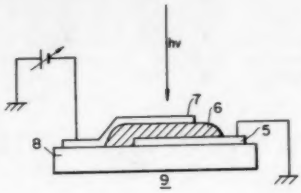
Toshihisa Hamano; Hisao Ito; Mutsuo Takenouchi; Takashi Ozawa; Mario Fuse, and Takeshi Nakamura, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1981, Ser. No. 329,471

Claims priority, application Japan, Dec. 10, 1980, 55-173228; Jun. 1, 1981, 56-82554

Int. Cl.³ H04N *1/02*

U.S. Cl. 358—294 **14 Claims**



1. A manuscript reader of the type having a photosensitive device receiving incident light from said manuscript and changing its conductive state in accordance with said incident light, and a detection circuit for detecting the conductive state of said photosensitive device, said photosensitive device comprising:

a substrate;

a first electrode formed on said substrate;

a photoconductive amorphous silicon film formed over said first electrode; and

a second electrode formed over said silicon film, one of said first and second electrodes being transparent and receiving said incident light, and the other of said first and second electrodes being formed of a material selected from the group consisting of chromium and chromium having a layer of chromium oxide formed on a surface thereof contacted by said silicon film.

4,419,697

FACSIMILE APPARATUS

Yoshinori Wada, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 13, 1981, Ser. No. 321,520

Claims priority, application Japan, Nov. 20, 1980, 55-163780; Nov. 20, 1980, 55-163781; Dec. 26, 1980, 55-184115; Dec. 29, 1980, 55-186709

Int. Cl.³ H04N *1/32*

U.S. Cl. 358—257 **10 Claims**

1. A facsimile apparatus comprising:

scanner means for scanning an original document to produce video data to be transmitted;

microcomputer means having a central processing unit, a read only memory containing an operating program and a first random access memory;

a second random access memory for storing extra or additional data which are absent on the original document;

replacing means for replacing a part of the video data from the original document with the additional data;

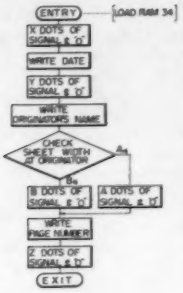
display means for displaying the additional data; and

printing means for printing the additional data on a recording medium;

in a transmission mode, said display means being controlled to display the name of a receiving facsimile apparatus and the page number, said printing means being controlled to print out the name of the receiving apparatus, time of

transmission, number of sheets transmitted and occurrence of failures during transmitting;

in a reception mode, said display means being controlled to display the name of a transmitting facsimile apparatus and



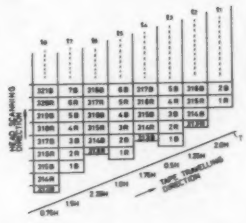
the page number, said printing means being controlled to print out the name of the transmitting apparatus, time of reception, page number and occurrence of failures during receiving.

4,419,698

COLOR VIDEO SIGNAL RECORDING AND/OR REPRODUCING SYSTEM

Yuma Shiraishi, Kamakura, and Yoshihiko Oota, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 20, 1981, Ser. No. 245,983
Claims priority, application Japan, Mar. 21, 1980, 55-35851
Int. Cl.³ H04N *5/782*
U.S. Cl. 358—330 **6 Claims**



1. A color video signal recording and/or reproducing system in which a luminance signal (including a synchronizing signal) and a carrier chrominance signal are respectively separated from a color video signal and are respectively converted into predetermined signal forms to be mixed, multiplexed, and successively recorded onto mutually adjacent parallel tracks on a recording medium, and said luminance signal and said carrier chrominance signal respectively having said predetermined signal forms which are obtained from a signal which is reproduced from said recording medium, are respectively returned into the original signal forms and said luminance and chrominance signals then being mixed and multiplexed in order to obtain a reproduced color video signal, recorded positions of horizontal synchronizing signals of the luminance signal contained in the mixed and multiplexed signal not being aligned in the mutually adjacent tracks on said recording medium, said recording system comprising:

first frequency converting means for frequency-converting said separated carrier chrominance signal into a low frequency range;

first delaying means coupled to said first frequency converting means, for adding a pre-established delay time to said carrier chrominance signal for every recording unit of each track, so that recording positions of each interval of said frequency-converted carrier chrominance signal corresponding to a horizontal synchronizing interval between the horizontal synchronizing signals of the luminance signal are aligned in the mutually adjacent tracks;

frequency modulator means for frequency-modulating said separated luminance signal;

first mixing means for respectively multiplexing the output luminance signal of said frequency modulator means and the carrier chrominance signal obtained from said first delaying means; and

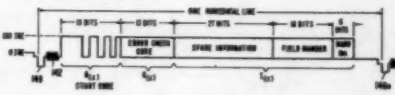
recording means for recording the multiplexed signal obtained from said first mixing means onto said recording medium.

4,419,699

DIGITAL ON VIDEO RECORDING AND PLAYBACK SYSTEM

Todd J. Christopher, Indianapolis, Ind., and Charles B. Dieterich, Plainsboro, N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 84,465, Oct. 12, 1979, abandoned. This application Nov. 16, 1981, Ser. No. 322,061
Int. Cl.³ H04N *5/91, 5/33, 5/76, 9/491*
U.S. Cl. 358—340 **2 Claims**



1. A microprocessor-controlled video disc player for playing back a video disc having recorded thereon a video signal including a subcarrier signal of a prescribed frequency, said video signal further including a digital information signal encoded during a horizontal line thereof, said digital information signal being synchronized with said subcarrier signal, and a further horizontal line having a signal value corresponding to a constant luminance level, said further horizontal line always being adjacent the horizontal line encoded with the digital information, said video disc player comprising:

signal pickup circuitry for recovering recorded signal from the disc record;

video processing circuitry responsive to the recovered signal including,

(a) means responsive to said subcarrier signal for generating a clock signal synchronous therewith, and having a cyclic rate equal to said prescribed frequency,

(b) means for subtracting one of said horizontal line encoded with digital information and said further horizontal line from the other of said horizontal line encoded with digital information and said further horizontal line to generate a self DC-referenced difference signal corresponding to said recorded digital information signal;

an information buffer responsive to said clock signal for synchronously detecting said recorded self-referenced digital information signal, and storing said digital information signal for use by the microprocessor; and

wherein said microprocessor is firmware programmed to generate a gating time interval responsive to said clock signal and said digital information signal and generating a control pulse at the end of said timing interval for enabling said information buffer to receive successive digital information signals.

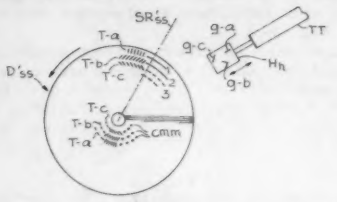
4,419,700
DUAL-TRACK SPIRAL RECORDING AND ASSOCIATED SYSTEM

Herbert U. Ragle, and Norman S. Blessum, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 807,155, Jun. 16, 1977, Pat. No. 4,166,282. This application Dec. 18, 1978, Ser. No. 970,442

Int. Cl.³ G11B *21/10*

U.S. Cl. 360—77 **33 Claims**



1. A high density digital data recording medium comprised of at least two co-recorded "spiral" interleaved tracks wherein each track is comprised of recording transitions aligned in at least one of two orthogonal skewed directions with respect to the respective track direction.

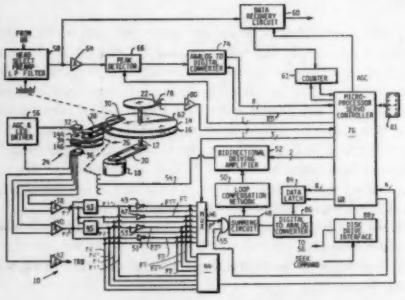
4,419,701
DATA TRANSDUCER POSITION CONTROL SYSTEM FOR ROTATING DISK DATA STORAGE EQUIPMENT

Joel N. Harrison, Campbell; Donald V. Daniels, Santa Cruz, and Bruce R. Peterson, San Jose, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed Sep. 21, 1981, Ser. No. 304,209

Int. Cl.³ G11B *17/00, 21/00*

U.S. Cl. 360—77 **16 Claims**



1. In a method for digitally controlling a continuous torque generating rotary actuator for a data transducer in a rotating disk data storage device having a multiplicity of concentric data tracks on at least one major surface of a said rotating disk in order to move said transducer from one said track to a selected other of said tracks in response to track selection information supplied from a host machine to which said device is connected and to keep said transducer centered in each selected track, said method comprising the steps of:

a. sensing an initial position of said transducer and storing said sensed position as a digital number;

b. receiving and storing as a digital number each track selection command;

c. electro-optically sensing movement of said transducer, converting said sensed movement to polyphase signals, processing said polyphase signals to define track boundaries, putting out said track boundary signals as digital signals, and digitally counting said boundaries relative to said stored initial sensed position depending on the direction of movement of said transducer away from or towards said initial sensed position, so that said transducer location is always known by digital counting;

d. calculating a seek command for said transducer in response to each said received and stored track selection command in reference to said counted transducer location;

e. moving said transducer from its present location to a said selected track by operating said actuator in response to said digital seek command and said sensed track boundary signals and signalling arrival of said transducer at said selected track to said host;

f. reading prestored data on a sector portion of said disk with said transducer, converting said read data to digital information, processing said digital information to generate a track centerline offset correction number, converting said number to analog and applying it, in conjunction with a selected one of said polyphase signals, to said actuator to move said transducer into alignment with centerline of said track and keep it aligned there while said transducer is located at said track.

4,419,702
AUTO-REVERSE DEVICE FOR A TWO-REEL TYPE TAPE RECORDER

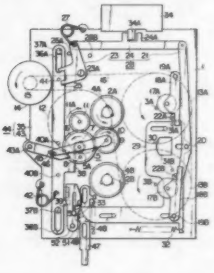
Shinsaku Tanaka, Tokyo, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed May 27, 1981, Ser. No. 268,097

Claims priority, application Japan, Jun. 20, 1980, 55-83703; Oct. 14, 1980, 55-142396; Oct. 14, 1980, 55-142397; Oct. 14, 1980, 55-142398

Int. Cl.³ G11B *15/06, 15/26*

U.S. Cl. 360—96.4 **6 Claims**



1. An auto-reverse device for a two-reel type tape recorder comprising:

a pair of reel shafts each provided with a working rotator to respectively rotate together therewith;

a magnetic head;

a pair of capstans disposed on both sides of said magnetic head respectively;

a pair of pinch rollers disposed correspondingly to said capstans and being arranged to be alternately pressed against their corresponding capstans;

a reversible motor for driving said capstans to rotate;

a pinch roller shift mechanism coupled to said pinch rollers for shifting the positions of said pinch rollers relative to said capstans in synchronism with a change of the rotating direction of said motor;

a driving rotator driven by said motor;

an intermediate rotator engaging said driving rotator and selectively engaging one of said working rotators in an alternative way to transmit the turning force of said driving rotator to the engaged one of said working rotators;

a rocking member mounted coaxially with said driving rotator, urged in the same direction as the rotating direc-

tion of said driving rotator by the turning force of said driving rotator, and being rockable in synchronism with a change of the rotating direction of said motor, thereby separating said intermediate rotator from one of said working rotators and causing said intermediate rotator to engage the other of said working rotators; and

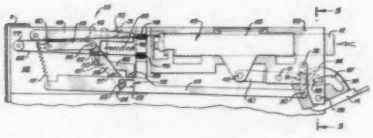
a transmission mechanism coupled to said pinch roller shift mechanism receiving the turning force of said motor in response to the rocking action of said rocking member, for thereby actuating said pinch roller shift mechanism to shift the position of said pinch rollers.

4,419,703

DISC CARTRIDGE LOADING MECHANISM

Norman P. Graczelak, Thousand Oaks, and Phillip S. Bryer, Woodland Hills, both of Calif., assignors to DMA Systems Corporation, Goleta, Calif.

Filed Nov. 16, 1981, Ser. No. 321,410
Int. Cl.³ G11B 5/012
U.S. Cl. 360—97 **12 Claims**



1. In a magnetic disc storage system of the type including a housing having an open-ended compartment adapted for receipt of a disc cartridge, the cartridge including a housing having a wall having first and second openings therein, the first opening having a movable door extending thereacross, the second opening being adapted for receipt of an opener rod for opening and closing said door, a wall at the closed end of said compartment having an opening therein positioned to be aligned with said first opening in said cartridge housing wall, and a head carriage movable through said opening in said compartment wall and said first opening in said cartridge housing wall for engaging the disc in said cartridge, a door activation mechanism comprising:

a movable shutter in said system housing adapted for movement between a first position sealing said opening in said compartment wall and a second position clear of said opening;

means for moving said shutter;

an opener rod mounted for linear movement in said system housing;

means for moving said opener rod into said second opening in said cartridge housing wall for opening and closing said cartridge door; and

means responsive to a cartridge being inserted into said compartment for inhibiting operation of said shutter moving means until said cartridge is fully inserted into said compartment.

4,419,704

BERNOULLI PLATE FOR STABILIZATION OF FLEXIBLE MAGNETIC DISK

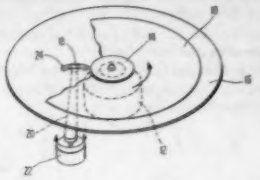
Anton J. Radman, Ogden; Randall C. Bauck, East Layton, and Peter S. Kleczkowski, Ogden, all of Utah, assignors to Iomega Corporation, Ogden, Utah

Filed Apr. 24, 1981, Ser. No. 257,482
Int. Cl.³ G11B 3/60, 17/32
U.S. Cl. 360—102 **8 Claims**

1. Method of manufacturing a Bernoulli plate for juxtaposition to a rotating magnetic disk so that said disk is stabilized, said method comprising the steps of:

providing a substantially flat, virgin plate consisting of a first relatively soft metal;

coining said plate at numerous locations with a sharply-pointed tool to form annular uplifted portions surrounding pits in said surface in a coining operation; and



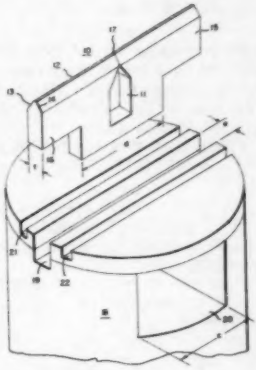
coating said coined plate with a layer of a second, relatively harder metal, whereby sharp edges, burrs and the like in said plate formed in said coining operation are smoothed.

4,419,705

FERRITE BEVELED CORE FOR MAGNETIC HEAD

Ralph D. Brower, and Paul D. Losee, both of Layton, Utah, assignors to Iomega Corporation, Ogden, Utah

Filed May 1, 1981, Ser. No. 259,706
Int. Cl.³ G11B 5/60
U.S. Cl. 360—103 **9 Claims**



1. A core for a magnetic head assembly comprising:

a T-shaped ferrite member having an aperture for receiving a transducing coil and a beveled edge along the top of the T for disposition adjacent to a magnetic recording medium.

4,419,706

MODE SWITCHING MECHANISM FOR A CASSETTE TAPE RECORDER

Sylvan Cole, 8376 Westlawn Ave., Los Angeles, Calif. 90045

Filed Apr. 27, 1982, Ser. No. 372,440
Int. Cl.³ G11B 5/54
U.S. Cl. 360—105 **2 Claims**

1. A retracting mechanism for disengaging a magnetic head and a pinch roller from a magnetic tape for use in combination with a tape recorder which includes a base plate, a capstan drive for driving the magnetic tape in a tape cassette and an electronic circuit, said retracting mechanism comprising:

a. a magnetic head disposed adjacent to the magnetic tape and electrically coupled to the electronic circuit;

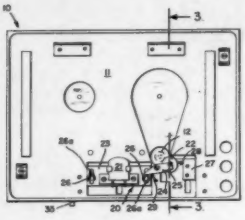
b. slidable mounting means for mounting said magnetic head slidably coupled to the base plate so that said magnetic head may move bidirectionally in a direction orthogonal to the direction which the magnetic tape travels across the

face of said magnetic head in order to engage the magnetic tape;

c. a lever arm which is pivotally coupled to the base plate and disposed adjacent, but not contiguous to, said capstan drive;

d. a pinch roller the axis of which is rotatably coupled to said lever arm;

e. first resiliently biasing means for resiliently biasing said lever arm so that said pinch roller pinches the magnetic tape against the capstan drive;



f. second resiliently biasing means for resiliently biasing said slidable mounting means so that said magnetic head engages the magnetic tape; and

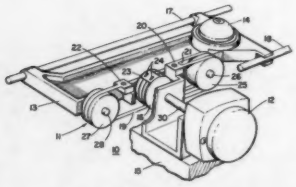
g. coupling means for coupling said lever arm and said slidable mounting means so that when said slidable mounting means moves said magnetic head away from the magnetic tape said coupling means pivotally moves said lever arm so that said pinch roller disengages said magnetic tape whereby said pinch roller is mechanically independent of said magnetic head when said magnetic head and said pinch roller engage the magnetic tape.

4,419,707

FLEXIBLE BAND POSITIONING DEVICE FOR A READ/WRITE HEAD

James G. Woodier, Morton Grove, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 12, 1981, Ser. No. 243,167
Int. Cl.³ G11B *5/55*
U.S. Cl. 360—106 **5 Claims**



1. Apparatus for positioning a read/write head over a record means, said apparatus comprising:

a stepper motor mounted on a support frame, said motor having an output shaft;

a drum mounted on said output shaft;

a carriage for supporting said read/write head, said carriage mounted on at least one guide surface located on said support frame;

a pair of spaced apart idler rollers rotatably mounted on said carriage;

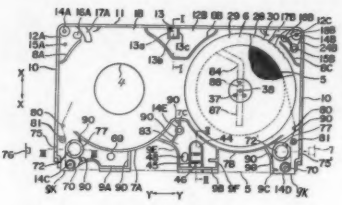
a flexible band wrapped at least partially around said drum, said band having two ends coming off said drum, each end passing around a different idler roller before being secured to said frame, wherein each idler roller is positioned so that portions of said band coming off said drum lie in a plane substantially parallel to the path of travel of said carriage, and portions of the band coming off each roller are secured to the frame so that each is parallel to said plane, whereby angular displacement of said drum through a specific angle results in a corresponding linear displacement of said carriage, said linear displacement being of the same magnitude along the entire path of travel of said carriage.

4,419,708

MAGNETIC RECORDING TAPE CARTRIDGE

Kenji Ogiro; Masayuki Fujisaki, both of Yokohama, and Shinichi Gotoh, Kyoto, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jul. 28, 1981, Ser. No. 287,555
Claims priority, application Japan, Jul. 28, 1980, 55-105602
Int. Cl.³ G11B *23/04*
U.S. Cl. 360—132 **4 Claims**



1. A magnetic recording tape cartridge comprising:

(a) a bottom section and a top section assembled together by a fastening means so as to provide a cartridge case having a front wall, a bottom wall and a tape chamber with a plurality of openings formed in said front wall,

(b) at least one tape reel accommodated in said tape chamber, rotatably mounted relative to a drive shaft insertion hole defined in the bottom wall of said bottom section of the cartridge case,

(c) a magnetic recording tape wound around said reel, the intermediate portion of said recording tape being stretched running along a predetermined path defined by said front wall,

(d) a lid member hingedly mounted on the cartridge case and having a generally straight lid plate disposed generally parallely with the front wall to close said openings of the front wall to protect the magnetic recording tape situated along the front wall, said lid member being rotated in a direction away from said front wall when used, said lid plate being provided with a pair of openings at the lower end portion in the both lateral end portions of the cartridge case so as to expose the corresponding portions of the front wall of the cartridge case for abutting onto a pair of positioning members provided in a cartridge mounting holder of a tape player,

(e) a pair of through-hole defined in the bottom wall of the bottom section for receiving at least one standard pin of the tape player with the diameter of the hole being larger than the diameter of the standard pin to loosely receive the standard pin in the hole, and

(f) means for positioning the cartridge case on a predetermined position of the tape player, having a movable member resiliently biassed by means of a resilient member to oppose the hole so as to resiliently engage with the standard pin inserted inside the cartridge case through the hole when the cartridge case is mounted on the tape player thereby clamping the standard pin between the movable member and a portion of the wall of the hole to cause the cartridge case to be detouchably secured in position.

4,419,709

CASE FOR A DISC-SHAPED RECORDING MEDIUM

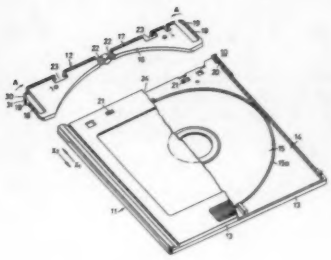
Takashi Saito; Osamu Tajima, and Masafumi Mochizuki, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 14, 1981, Ser. No. 263,851

Claims priority, application Japan, May 15, 1980, 55-66678[U]

Int. Cl.³ G11B *5/82, 25/04*

U.S. Cl. 360—133 5 Claims



1. A case for a disc-shaped recording medium used in a reproducing apparatus, said reproducing apparatus having an inserting opening through which said case is inserted, a turntable for rotating said disc-shaped recording medium, and locking means and engagement releasing means at the innermost part of said reproducing apparatus and opposite to said inserting opening, with said turntable positioned between said innermost part and said opening, said case comprising:

a jacket having a space for accommodating said disc-shaped recording medium and an opening for enabling said disc-shaped recording medium to go in and out of said jacket; and

a closing member inserted through said opening of said jacket for closing said opening of said jacket, said closing member unitarily having a pair of bendable elastic engaging arms on both sides thereof,

said closing member being locked by said locking means upon insertion into said innermost part of said reproducing apparatus together with said jacket,

said engaging arms and said jacket having means for preventing said closing member from slipping out of said jacket when said closing member is inserted into a predetermined position within said jacket,

said engagement releasing means having engagement releasing members which make contact with and push against sloping surfaces of said engaging arms for bending said engaging arms inwardly, upon an insertion of said closing member into the innermost part of said reproducing apparatus, together with said jacket;

said engaging arms and said engagement releasing members having a deviation preventing engaging part at least at a part where said engaging arms and said engagement releasing members respectively make contact, for preventing a deviation so that said engaging arms and said engagement releasing members do not miss each other within a plane which is perpendicular to a plane in which said closing member extends.

4,419,710

CASE FOR A DISC-SHAPED RECORDING MEDIUM

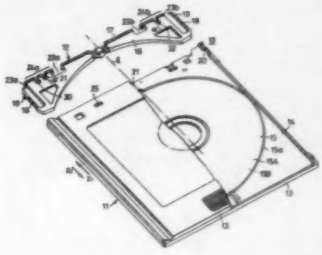
Hiroyuki Sugiyama, Ischara; Masaki Sakurai; Ryuzo Abe, both of Yokohama; Yasuhiro Yusa, Fujisawa, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 30, 1981, Ser. No. 288,291

Claims priority, application Japan, Jul. 31, 1980, 55-108490[U]

Int. Cl.³ G11B *25/04, 5/82;* B65D *85/30*

U.S. Cl. 360—133 5 Claims



1. A case for a disc-shaped recording medium used in a reproducing apparatus, said reproducing apparatus having a turntable for rotating said disc-shaped recording medium, closing member locking means at the innermost part of said disc shaped recording medium reproducing apparatus, and N detection switches located at the innermost part of said reproducing apparatus and disposed asymmetrically on the left and right sides with respect to a line which passes through the center of said turntable in the disc insertion direction, said case comprising:

a jacket for accommodating said disc-shaped recording medium; and

a closing member for closing an opening of said jacket and being locked by said locking means and confront said detection switches when said disc-shaped recording medium is loaded into said reproducing apparatus, said closing member having cutout desired areas which are symmetrical on the left and right sides, each of said sides having N desired sections where cutouts are selectively formed for discrimination between types of said recording medium, said cutout desired sections being positioned for discrimination at symmetrical locations on the left and right side and being brought to confront the same detection switch out of said N detection switches when said closing member is reversed with respect to up and down together with said jacket and said disc-shaped recording medium, one cutout desired section of said pair of cutout desired sections which are symmetrical on the left and right sides being selectively cutout or non-cutout for discriminating a first side of said disc-shaped recording medium, and the other cutout desired section being selectively cutout or non-cutout for discriminating a second side of said disc-shaped recording medium.

4,419,711

METHOD AND APPARATUS FOR THE PROTECTION OF ELECTRICAL EQUIPMENT FROM HIGH VOLTAGE TRANSIENTS

Herb J. J. Seguin, 7840-44th Ave., Edmonton, Alberta, Canada P6K 0Z1

Continuation-in-part of Ser. No. 108,215, Dec. 28, 1979, Pat. No. 4,328,523. This application Jul. 6, 1981, Ser. No. 280,366

Int. Cl.³ H02H *3/20*

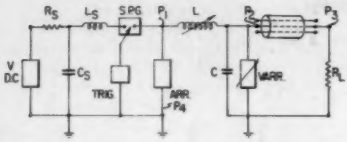
U.S. Cl. 361—111 36 Claims

1. A high voltage transient protection unit for connection between a power source and a load comprising:

a recoverable spark gap electrically connected to the power source,

an L-C filter electrically connected to said recoverable spark gap; and

a voltage variable resistor electrically connected to said L-C filter and to the load; and



a first means for connecting said recoverable spark gap to a first grounding circuit; and

a second means for connecting said filter and said voltage variable resistor to a separate and distinct grounding circuit.

4,419,712

ELECTRONIC DOOR LOCKING SYSTEM FOR AN AUTOMOTIVE VEHICLE

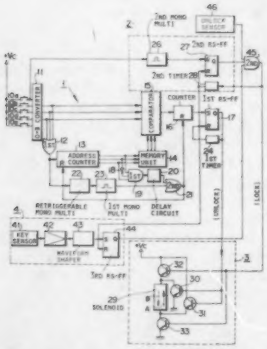
Keiichi Shimizu, Tokyo, and Haruo Mochida, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa and Kokusan Kinzoku Kogyo Co., Ltd., Tokyo, both of, Japan

Filed Apr. 29, 1982, Ser. No. 373,286

Claims priority, application Japan, Apr. 30, 1981, 56-66013

Int. Cl.³ E05B *49/00*

U.S. Cl. 361—172 **7 Claims**



2. An electronic door locking system for an automotive vehicle for locking vehicle doors which comprises:

(a) means for inputting a sequence of unlocking coded numbers and at least one locking coded number and outputting signals corresponding thereto;

(b) means for generating an unlock command signal in response to a sequence of unlocking coded numbers outputted from said means for inputting coded numbers;

(c) means for generating a lock command signal in response to at least one locking coded number outputted from said means for inputing coded numbers;

(d) an AND gate one input terminal of which is connected to said means for generating a lock command signal;

(e) means for locking/unlocking the vehicle doors connected to said means for generating an unlock command signal for unlocking the vehicle doors in response to the unlock command signal outputted from said means for generating an unlock command signal and connected to the output terminal of said AND gate for locking the vehicle doors;

(f) means for detecting the presence of the ignition key the output terminal of which is connected to the other input terminal of said AND gate, for outputting a signal to said AND gate to pass the door locking command signal outputted from said means for generating a lock command signal to said means for locking/unlocking the vehicle doors,

whereby the vehicle doors can be locked when at least one predetermined door-locking coded number is inputted to the system and when the ignition key is extracted from the ignition keyhole and brought near the means for detecting the presence of the ignition key.

4,419,713

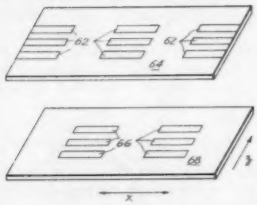
MULTIPLE ELECTRODE SERIES CAPACITOR

Solomon Levinson, Forest Hills, N.Y., assignor to Centre Engineering, Inc., State College, Pa.

Filed Jul. 6, 1981, Ser. No. 281,010

Int. Cl.³ H01G *4/42*

U.S. Cl. 361—321 **10 Claims**



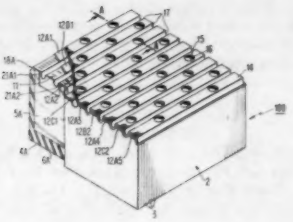
1. A high voltage non-discoidal multiple electrode series capacitor comprising a dielectric material and a plurality of first and second planar electrodes embedded therein, said structure of said dielectric material and said first and second electrodes being integral and having a substantially rectangular shape having width, depth and height dimensions, said plurality of first planar electrodes having dimensions in the width and depth directions of said structure being spaced apart and being located in a first row extending across the width of said structure with the outer electrodes of the row of said plurality of first electrodes extending to each side edge of said dielectric material, a first space formed between each pair of adjacent first planar electrodes, each of said first spaces being substantially uniform, said plurality of second planar electrodes having dimensions in the width and depth directions of said structure being spaced apart and being located in a second row extending across the width of the structure with a second space formed between each pair of adjacent second planar electrodes, the number of said plurality of second planar electrodes being one less than the number of said plurality of first planar electrodes, said first and second rows being parallel to and in alignment with each other and spaced apart by a gap from each other with each of said second planar electrodes bridging a respective one of said first spaces between said first electrodes, electrical junction means connected at the side edges of said dielectric to provide an electrical junction at each side edge of said outer electrodes of said first row and for said multiple electrode series capacitor, said multiple electrode series capacitor being formed by a plurality of series capacitor subsections with each subsection being formed by a pair of first electrodes and a bridging second electrode, wherein each of said first planar electrodes is of substantially uniform size and the capacitance value of said capacitor subsections is substantially equal.

4,419,714

LOW INDUCTANCE CERAMIC CAPACITOR AND METHOD FOR ITS MAKING

Charles H. Locke, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,819
Int. Cl.³ H01G *4/34, 13/00*; H01L *1/02*
U.S. Cl. 361—321 **24 Claims**



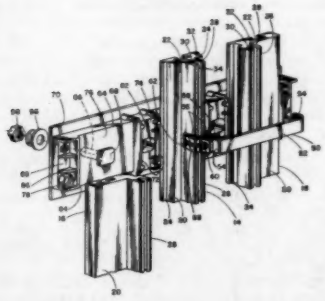
1. In a capacitor structure having a ceramic body of particular length, width, and height the structure including multiple capacitor plates located at intervals displaced in the body in the direction of the body length, each plate having one or more tabs, the tabs being exposed at a common body face, the capacitor additionally having one or more buses for selectively electrically interconnecting the tabs such that the buses may be electrically interconnected to establish one or more capacitors of particular capacitance value and voltage rating, the improvement comprising providing grooves in the capacitor body at the common face to align the tabs in groups and to insure separation of the resulting tab groups.

4,419,715

BUS BAR ASSEMBLY FOR PANELBOARDS AND SWITCHBOARDS

Daniel G. Pear, Peru, Ind., assignor to Square D Company, Palatine, Ill.

Filed Apr. 6, 1981, Ser. No. 251,424
Int. Cl.³ H02B *1/20*
U.S. Cl. 361—335 **13 Claims**



1. A bus bar assembly comprising:

a plurality of aluminum bus bars having a generally rectangular cross-sectioned base portion and an integrally connected generally U-shaped cross-sectioned plug-on portion projecting upwardly therefrom and extending continuously throughout the length of said bus bar, said base portion having a T-shaped slot extending continuously throughout the length of said bus bar on the side opposite said plug-on portion; said plug-on portion comprising a solid section projecting upwardly from one side of said bus bar, said solid section having a bottom portion integrally connected to said base portion and a top portion spaced from said base portion, and including a pair of spaced apart upwardly projecting legs extending from the top portion of said solid section longitudinally along the length of the bus bar forming a center indentation; said base portion of each said bus bar having a predetermined width, said plug-on portion each having a width substantially less than said predetermined width,

a plug-on extension having opposite spring held jaws in overlapping engagement with the outer edges of said projecting legs of said plug-on portion of each bus bar

a plurality of parallel, spaced apart, generally rectangular insulating bases having a top portion and a bottom portion, said bases supporting said bus bars on said top portion, each insulating base including a pair of ribs intermediate adjacent bus bars and having separate channels engaged with the base of each bus bar, the bottom portion of said insulating bases having a plurality of recesses including a nut receiving recess beneath the center of each channel, said insulating bases having an aperture providing a passage from each said top channel portion to said respective nut receiving recess;

a T-bolt for each channel of each insulating base having a head received in said T-slot of a respective bus bar and a shaft extending through said respective passage; and

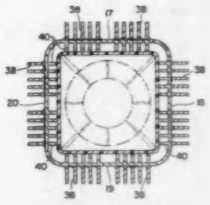
a nut wholly contained in each said nut receiving recess threadingly receiving said T-bolt and securing each said bus bar to said respective insulating base.

4,419,716

VAPOR PROOF HOUSING ASSEMBLY AND SYSTEM

Stephen Koo, 83-58 Charlecote Ridge, Jamaica, N.Y. 11432

Filed Jan. 3, 1983, Ser. No. 455,421
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—96 **11 Claims**

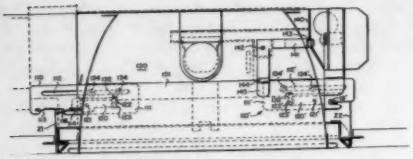


1. A sealed vapor proof housing assembly for isolating an electrical device from the ambient atmosphere external of said housing comprising: a hollow casing having a removble door for providing access to the interior of the casing; means for securing said door against said casing to provide a sealed enclosure within the interior thereof; a first multiple number of heat exchange fins projecting from said casing into the ambient atmosphere; a second multiple number of heat exchange fins projecting from said casing within said enclosure; a sleeve liner disposed within said enclosure contiguous to said second multiple number of heat exchange fins for forming a compartment within said enclosure; said sleeve liner having two open ends with each open end being recessed a predetermined distance from said casing to provide a clearance space at each open end between said sleeve liner and said casing, said electrical device being mounted upon said sleeve liner in said compartment and a power driven fan for circulating a cooling fluid in a closed circulating pattern through said compartment and said enclosure in intimate contact with said second multiple number of heat exchange fins.

4,419,717
CEILING SUPPORTED LIGHTING FIXTURES

Edison A. Price, New York, and Fulgencio Bengochea, East Meadow, both of N.Y., assignors to Edison Price, Incorporated, New York, N.Y.

Filed Oct. 2, 1981, Ser. No. 307,803
Int. Cl.³ F21S 1/02
U.S. Cl. 362—148 13 Claims

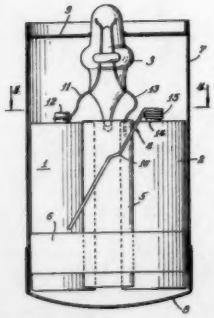


1. In a ceiling supported lighting fixture having end plates and a device connected to the end plates for clamping the fixtures into a desired position on a ceiling support member, the improvement wherein the clamping device comprises two clamping plates on each end of the fixture, each having a notch therein for receiving a ceiling support member; and means for locking a track in the notches to prevent inadvertent relative movement, the locking means comprising mounting means for mounting the clamping plates to the side plate in parallel with respect thereto to effect alignment of the notch and a track, and a latch member on at least one clamping plate having an end portion disposed perpendicular to the clamping plate and wherein the locking means is movable between an unlocked position wherein the ceiling supports are free to be received in the notches and a locked position wherein the end portion biases the received support members into the notches under tension.

4,419,718
POCKET FLASHLIGHT

Paul R. Chabria, West Chicago, Ill., assignor to Press-A-Lite Corporation, West Chicago, Ill.

Filed Jun. 12, 1981, Ser. No. 273,229
Int. Cl.³ F21L 15/00
U.S. Cl. 362—205 1 Claim

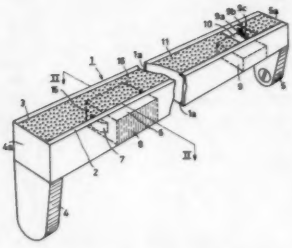


1. In a flashlight comprising first and second dry cells spaced apart in upright position and supported by a body of insulating material, each said cell having a center post positive terminal at the top thereof and an exposed metal can negative terminal, a lamp connected in series between said positive terminal of said first cell and said negative terminal of said second cell, switching means comprising a spring wire conductor connected at one terminus thereof to said positive terminal of said second cell and extending diagonally downwardly over said insulating body toward said first cell, the free end of said spring wire conductor being normally spaced from said exposed metal can negative terminal, and a flexible jacket covering said cells and switching means through which said spring wire conductor may be pressed inwardly to bring said free end of said spring wire conductor into electrical engagement with said exposed metal can negative terminal, the improvement in said switching means comprising a bend in said spring wire conductor forming a fulcrum approximately midway between said terminus and said free end of said spring wire conductor to engage said insulating body and limit the bending of said spring wire conductor essentially to the portion thereof between said fulcrum and said free end thereof when said spring wire conductor is pressed inwardly to engage said negative terminal of said first cell to light said flashlight.

4,419,719
LUMINAIRE

Kornelis Boer, and Hugo De Widt, both of Oss, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 18, 1981, Ser. No. 264,264
Claims priority, application Netherlands, Jun. 13, 1980, 8003434
Int. Cl.³ F21S 2/00
U.S. Cl. 362—218 8 Claims



1. A luminaire for at least one tubular discharge lamp comprising an elongate thin walled housing with lamp accommodating means positioned at the ends of said housing, at least one electric stabilization ballast situated in the housing, the housing being filled with a quantity of cured foamed plastics material, characterized in that said housing is trough-shaped with generally U-shaped cross-section and the cured foamed plastics material extends to the open side of said housing and is cured within said luminaire.

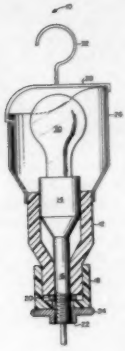
4,419,720
TROUBLE LAMP

Theodore W. Kenney, 13239 Lupine, Trona, Calif. 93562

Filed Oct. 6, 1981, Ser. No. 308,982
Int. Cl.³ F21V 7/00
U.S. Cl. 362—285 1 Claim

1. A trouble lamp comprising:
a hollow body member having opposed open ends;
a tubular shield mounted on said body member at one end thereof and a cylindrical cup shaped extension member telescopically mounted on the other end;
a socket for an electrical light bulb slidably mounted within said one end of said body member and having a rigid cylindrical conduit integral therewith and extending through said other end of said body member and said cup shaped extension member;
said cup shaped extension member having a bottom portion bored to receive said conduit;
fastening means integrally connecting said conduit to said bottom portion;
said shield having an inner portion wherein the bulb may be positioned to more or less completely rest beneath the rim of said said shield and a side portion which shields light from one side only; and

said socket and conduit having outer surfaces complementary to inner surfaces of said body member and dimensioned for slip friction fit therebetween and permitting



manipulation of said socket within said one end of said body between a fully extended position, a median side shielding position and a fully retracted position thereof.

4,419,721

SEARCHLIGHT WITH MODULAR CONTROL MECHANISM

Brian R. Gregoire, Brookfield, and Rupert O. Yantz, West Bend, both of Wis., assignors to Phoenix Products Company, Inc., Milwaukee, Wis.

Filed Dec. 21, 1981, Ser. No. 332,404
Int. Cl.³ B60Q *1/00*
U.S. Cl. 362—368 **12 Claims**

1. In a searchlight control system of the type including a support base having a pedestal for attachment to a structural element on which a searchlight is to be mounted and a rotatable member supported on the pedestal, an azimuth yoke attached to the rotatable member for rotation therewith, a searchlight pivotally supported in the azimuth yoke, an elevation yoke attached to the searchlight, and a control mechanism operatively associated with the azimuth yoke and the elevation yoke for positioning the searchlight,

the improvement in which the control mechanism comprises:

(1) an upper torque tube journalled within the pedestal and having a first end attached to the rotatable member of the support base and a second end extending from the pedestal of the support base,

the upper torque tube consisting of a hollow tubular shaft;

(2) an upper push rod positioned inside the upper torque tube and having a first end attached to the elevation yoke and a second end extending from the pedestal of the support base;

(3) a lower torque having a first end connected to the upper torque tube and a second control end remote therefrom,

the lower torque tube consisting of a hollow tubular shaft;

(4) a push rod coupling having a first end connected to the upper push rod and a second end remote therefrom;

(5) a lower push rod having a first end connected to the second end of the push rod coupling and a second control end remote therefrom; and

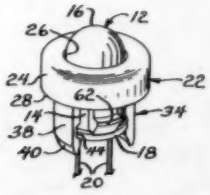
(6) control means operatively connected to the control end of the lower torque tube and the control end of the lower push rod to rotate the lower torque tube to position the searchlight in azimuth and to reciprocate the lower push rod to position the searchlight in elevation.

4,419,722

LIGHT EMITTING DIODE HOLDER

George J. Bury, 25380 Dering La., Lake Villa, Ill. 60046

Filed May 7, 1982, Ser. No. 375,912
Int. Cl.³ F21V *21/00*
U.S. Cl. 362—396 **7 Claims**

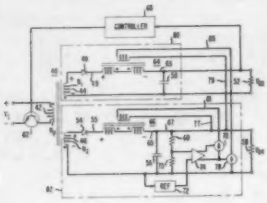


1. A holder of the resilient plastic material for mounting to a light emitting device in an aperture in a panel comprising a body having a central channel for receiving said light emitting device, said body being of larger transverse dimensions than said aperture to lie against said panel, a first pair of relatively short fingers on said body in diametrically opposed relation about said channel to extend through said aperture and having outwardly projecting tapered shoulders to wedgingly engage the opposite side of said panel to retain said holder in said aperture, and a second pair of relatively long fingers on said body in diametrically opposed relation to one another and spaced ninety degrees from each of said first pair of fingers about said channel, and means on said second pair of fingers disposed inwardly thereof to retain a light emitting device therein, where each of said relatively long fingers has an inner margin lying on a cylinder of substantially the same diameter as said channel, and each of said relatively short fingers has an inner margin lying on a cylinder of larger diameter than said aperture and hence spaced from a light emitting device held by said relatively long fingers to permit flexing of said relatively short fingers upon insertion of said holder in said panel aperture.

4,419,723
REGULATION OF MULTIPLE-OUTPUT DC-DC CONVERTERS

Thomas G. Wilson, Jr., Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1981, Ser. No. 316,496
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—21 **8 Claims**



1. A DC-to-DC converter comprising

an input circuit for accepting a DC voltage source and including a power switch and a primary winding of a power transformer

the power transformer including at least first and second secondary windings

first and second output circuits coupled to the first and second secondary windings and including first and second inductors with adjustable permeance, respectively,

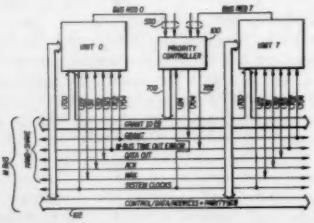
means for regulating a voltage output of the first output circuit by controlling an on-off cycle of the power switch, and

means response to a voltage output of the second output circuit to generate a bias current operative for adjusting a permeance of at least the second inductor to a value remaining substantially constant during any one on-off cycle of operation of the power switch wherein the second inductor of the second output circuit as so adjusted is operative to counteract a drift in magnitude of an output voltage.

4,419,724
MAIN BUS INTERFACE PACKAGE

Michael H. Branigin, Penllyn; Edward G. Sherbert, Plymouth Meeting, and Joseph F. Krasucki, Jr., Downingtown, all of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,285
Int. Cl.³ G06F *3/04*
U.S. Cl. 364—200 **7 Claims**



1. In a bus control system having a plurality of units connected to a common bus, each unit including means for producing a bus request signal and an expected destination code identifying a unit as an expected destination unit when it desires to communicate with another unit connected to said common bus, said system further incuding a priority controller responsive to bus request signals generated by said units for generating a grant identification for identifying one of said units as a source unit having access to said common bus, said grant identification being applied to all said units, the improvement comprising:

a lock register in each of said units, each of said lock registers having a plurality of stages, each of the stages corresponding to one of said units;

means in each of said units for selectively setting corresponding stages in said lock registers when the unit corresponding to said stages is unavailable for communication and selectively resetting corresponding stages in said lock register when the unit corresponding to said stages is available for communication;

means in each said unit responsive to an expected destination code generated in said unit and to the lock register in said unit for inhibiting the means in said unit for producing a bus request signal;

whereby a unit does not produce a bus request signal when the expected destination unit with which it desires to communicate is unavailable for communication with it,

said means for selectively setting and resetting the stages of said lock registers comprising:

first means in each said unit for generating a code representing the identity of said unit;

second means in each said unit for comparing the generated code for the unit with the grant identification produced by said priority controller and producing an enable data out signal for gating data from the unit to said common bus, the unit in which said enable data out signal is produced being designated a source unit;

the data produced by said source unit including a lock bit and a destination identification code identifying one of said units as a destination unit, said data being applied over said common bus to all said units connected thereto;

third means in each of said units for comparing said generated code with said destination identification code and generating an acknowledge signal upon an equal comparison, said acknowledge signal being applied over said bus to all said units; and,

fourth means in each of said units responsive to said acknowledge signal, said grant identification, said destination identification code and said lock bit for selectively setting and resetting the stages of said lock register corresponding to said source unit and said destination unit.

4,419,725
CACHE/DISK SUBSYSTEM WITH TAGALONG COPY

Benjamin T. George, Sunnyvale, and Patricia C. Chen, Cupertino, both of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 14, 1980, Ser. No. 207,094
Int. Cl.³ G06F *13/00, 11/16*
U.S. Cl. 364—200 **4 Claims**

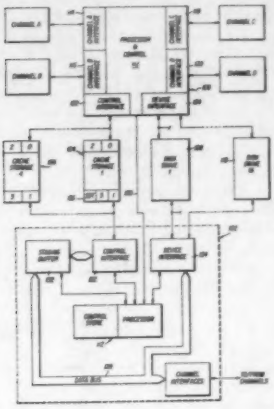
1. In a cache/disk system having a host processor, a disk drive device for driving a disk, a cache store providing space for storing segments of data, a segment descriptor table store for storing a table of segment descriptor entries, there being an entry in said table corresponding to each segment of data resident in said cache store, and a storage control unit for controlling transfers of data between said host processor, said cache store, and said disk, the improvement comprising:

means providing additional storage space in said cache store at the end of each data segment storage space;

first means in said storage control unit for forming a new segment descriptor table entry each time a data segment in said cache store is written to;

second means responsive to said first means for replacing the segment descriptor table entry corresponding to a written-to data segment with the new segment descriptor table entry for the written-to data segment; and,

third means responsive to said first means for storing a copy of each new segment descriptor table entry in said cache



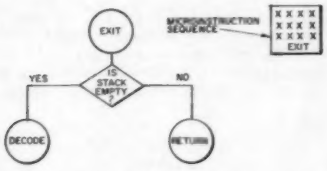
store in the additional storage space at the end of its corresponding written to data segment.

4,419,726

INSTRUCTION DECODING IN DATA PROCESSING APPARATUS

Albert J. Weidner, Tempe, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 16, 1981, Ser. No. 225,701
Int. Cl.³ G06F 9/36, 9/42
U.S. Cl. 364—200 **12 Claims**



1. An instruction decoding system for a data processing apparatus in which alternative instruction interpretations are dependent upon the operational state of at least a part of said apparatus comprising:

instruction register means **(25, 26)** for storing an instruction;

subroutine stack means **(27, 28)** for generating a generic exit signal which can indicate either a return command or a decode command;

detection means **(34)** for detecting the status of said stack means and producing a control signal representative of said status;

instruction decoding means **(29, 30, 36, 37, 38)** connected to said instruction register means and to said detection means and functioning to produce instruction execution signals based upon the combination of said instruction and said control signal from said detection means in order to determine whether said exit signal is a return command or a decode command in response to said control signal; and

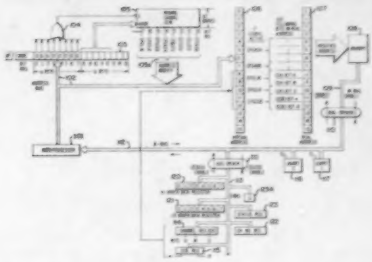
an arithmetic or logical function means **(39)** having an input connected to said instruction decoding means and responsive to said instruction execution signals to perform a predetermined arithmetic or logical operation.

4,419,727

HARDWARE FOR EXTENDING MICROPROCESSOR ADDRESSING CAPABILITY

Thomas O. Holtey, Newton, and Robert C. Miller, Braintree, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 304, Jan. 2, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 269,502
Int. Cl.³ G06F 9/36
U.S. Cl. 364—200 **13 Claims**



1. In a computer system having at least one microprocessor, a plurality of address modification registers, and a memory having memory locations addressed by real addresses, said memory containing instruction words executable by said microprocessor, some of said instruction words being short type instruction words having shorter address fields than others of said instruction words and being capable of addressing a first number of said memory locations which is less than the total number of locations in said memory, an apparatus for extending the addressing capability of said short type instruction words comprising:

(a) means for detecting whether an instruction word currently being executed by said microprocessor is a short type instruction word;

(b) signal generating means activated by said detecting means and when said detecting means indicates that said instruction word currently being executed is a short type instruction word, said signal generating means generating a predetermined number of control signals; and

(c) first means coupled to said signal generating means and to said address modification registers, said first means responding to said control signals and to data stored in said address modification registers to convert said address fields of said short type instructions being executed by said microprocessor into real addresses for addressing said memory locations in said memory, the number of real addresses which can be formed by said first means being greater than said first number of memory locations.

4,419,728

CHANNEL INTERFACE CIRCUIT PROVIDING VIRTUAL CHANNEL NUMBER TRANSLATION AND DIRECT MEMORY ACCESS

Allen L. Larson, Thornton, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 22, 1981, Ser. No. 276,060
Int. Cl.³ G06F 3/00
U.S. Cl. 364—200 **15 Claims**

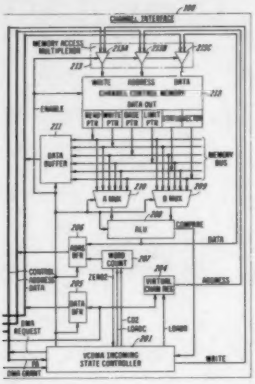
1. In a data communication system wherein a communication channel **(120)** carries data messages, each of which contains a header field having a destination address and a virtual channel number, a processor **(101)** having data, address and control busses and an associated memory **(102)** connected to said data, address and control busses, a channel interface circuit **(100)** for interconnecting said data, address and control busses with said communication channel **(120)** comprising:

interface means **(119, 201, 204, 205)** connected to said com-

munication channel (120) and responsive to a data message appearing thereon for receiving said data message when said destination address identifies said processor (101);

wherein said interface means (119, 201, 204, 205) includes incoming state controller means (201) responsive to said received data message for seizing said data, address and control busses;

channel control memory means (212, 213) connected to said interface means (119, 201, 204, 205) and responsive to said received data message for translating said virtual channel number to a hardware address identifying a memory storage location in said processor memory (102);



driver means (206) connected to both said channel control memory means (212, 213) and to said address bus and responsive to said hardware address for placing said hardware address on said address bus to activate said identified memory store location in said processor memory (102); and

wherein said interface means (119, 201, 204, 205) is also connected to said data bus and is responsive to said received data message for directly storing the data portion of said data message as received in said activated memory store location via said data bus.

4,419,729
AUTOMATIC SPEED CONTROL FOR HEAVY VEHICLES

Robert D. Krieder, Sullivan, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 27, 1980, Ser. No. 200,798
Int. Cl.³ G06G *7/70*; B60K *31/00*
U.S. Cl. 364—426 **13 Claims**

1. An automatic speed control for a vehicle comprising:

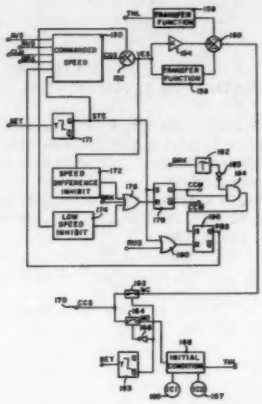
means for generating an actual speed signal proportional to the actual speed of the vehicle;

means for generating a commanded speed signal proportional to the desired speed of the vehicle;

means for generating a speed error signal proportional to the difference between said actual and commanded speed signals;

means for generating a control signal as a function of said speed error signal wherein said control signal regulates said actual vehicle speed to reduce said error signal; and

means for limiting the commanded speed signal to a set value when it exceeds a predetermined limit, said limiting means including means for comparing said commanded speed signal with said predetermined limit, for transmitting the commanded speed signal unmodified if the command speed signal is less than the limit, and for transmitting said set value as the commanded speed signal if the commanded speed signal is in excess or equal to the limit, wherein said comparing means includes a unity gain amplifier having at least one gain resistance which is variable

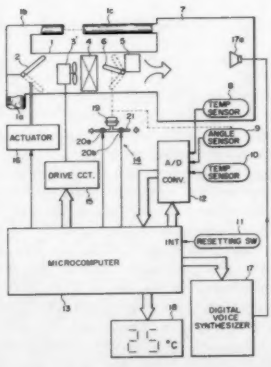


to change the gain of the amplifier and means for changing the gain of the amplifier when said commanded speed signal is greater than or equal to said predetermined limit.

4,419,730
METHOD AND SYSTEM FOR CONTROLLING THE SETTING TEMPERATURE OF A VEHICLE AIR CONDITIONER

Yoji Ito, Kariya; Yozo Inoue, Chiryu, and Kiyoshi Hara, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 9, 1981, Ser. No. 223,744
Claims priority, application Japan, Feb. 18, 1980, 55-19565; Mar. 5, 1980, 55-27825; Jul. 18, 1980, 55-98894
Int. Cl.³ G05D *23/00*; H04M *1/00*
U.S. Cl. 364—424 **12 Claims**



1. An apparatus for controlling an air conditioner mounted on a motor vehicle, said air conditioner being operable at a variable reference temperature setting, comprising:

means for generating a command signal in response to an instruction given by a vehicle occupant;

a voice synthesizer; and

data processing means for generating a vocal announcement

code indicative of a temperature value in response to a first occurrence of said command signal to cause said voice synthesizer to generate a vocal announcement of said temperature value to allow said vehicle occupant to give a subsequent instruction, and resetting said reference temperature setting to said temperature value in response to a second occurrence of said command signal.

4,419,731

APPARATUS FOR ESTIMATING SLANT VISIBILITY IN FOG

Alan W. Puffett, Bedford, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

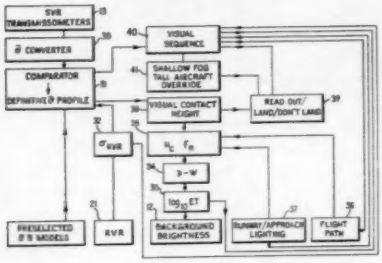
PCT No. PCT/GB80/00046, § 371 Date Nov. 17, 1980, § 102(e) Date Nov. 17, 1980, PCT Pub. No. WO80/02073, PCT Pub. Date Oct. 2, 1980

PCT Filed Mar. 18, 1980, Ser. No. 224,563

Claims priority, application United Kingdom, Mar. 19, 1979, 7909508

Int. Cl.³ G01C *3/08*; G06F *15/48*

U.S. Cl. 364—428 **17 Claims**



1. An apparatus for estimating slant visual range in fog comprising:

a transmissometer array, having at least three transmissometer elements at respectively greater differing heights h_1, h_2 and h_3 above the ground and disposed for operation between the differing heights and ground level, for generating transmissometer signals indicative of a fog strength; and

a slant visual range (SVR) computer coupled to said transmissometer array so as to receive the transmissometer signals therefrom, said SVR computer having:

means for converting the transmissometer signals into signals σh_1, σh_2, σh_3 representing the mean integral of extinction coefficient between said respectively greater heights h_1, h_2, h_3, above ground and ground level;

means for storing a predetermined set of extinction coefficient σ_k function models, each model characterising a different type of fog pattern, each model having predetermined criteria for its selection and use, and containing at least one empirical constant;

means for selecting one of the models in accordance with values of σh_1, σh_2, σh_3 determined by said converting means;

means for determining the values of the empirical constant in the selected model thus obtaining a definitive extinction coefficient profile,

means for storing values representing airfield lighting and accepting values representing flight path and background brightness, and

means for estimating slant visual range from the definitive profile and the airfield lighting, background brightness and flight path values.

4,419,732

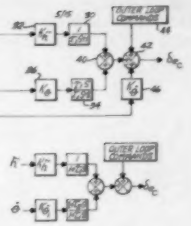
METHOD AND APPARATUS FOR AN AIRCRAFT INNER LOOP ELEVATOR CONTROL SYSTEM

Antonius A. Lambregts, Issaquah, and Rolf Hansen, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 14, 1981, Ser. No. 301,911

Int. Cl.³ G06G *7/78*; G05D *1/12*

U.S. Cl. 364—428 **7 Claims**



1. In an aircraft flight control system wherein inner loop damping signals are combined with outer loop command signals to produce an elevator control signal, improved inner loop damping signal apparatus comprising:

means for providing a signal h representative of aircraft vertical acceleration;

means for amplifying said h signal by a predetermined gain factor K_h;

means for providing a signal θ representative of aircraft pitch;

means for amplifying said θ signal by a predetermined gain factor K_θ;

low pass filter means for attenuating said h signal above a predetermined frequency ω;

high pass filter means for attenuating said θ signal below said frequency ω;

means for providing a signal $\dot{\theta}$ representative of aircraft pitch rate;

means for amplifying said $\dot{\theta}$ signal by a predetermined gain factor $K_{\dot{\theta}}$; and

summer means for summing said low pass filtered h signal, said high pass filtered θ signal, said amplified $\dot{\theta}$ signals and the outer loop command signal to thereby produce the control signal.

4,419,733

TIME DEVIATION AND INADVERTENT INTERCHANGE CORRECTION FOR AUTOMATIC GENERATION CONTROL

Charles W. Ross, Lansdale, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Apr. 20, 1981, Ser. No. 255,610

Int. Cl.³ G06G *7/635*

U.S. Cl. 364—493 **4 Claims**

3. Apparatus for controlling each area of a multiple-area interconnected electric power system for providing net-interchange tie-line bias control from an improved area control error signal provided so that said error signal is indicative of the sum of the load change in the area and the unscheduled energy transfer with the system as determined from signals available for each area representing the following measurements and settings: net interchange schedule setting, net interchange measurements, scheduled system frequency setting, system frequency measurement, an area frequency bias, and a control weighting factor, comprising:

means for producing a first different signal by comparing the net interchange measurement and setting;

means for integrating said first difference signal to produce a

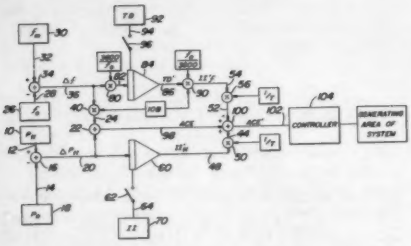
signal representing a calculated value of the inadvertent interchange;

means for producing a second difference signal by comparing the system frequency measurement and setting;

means for integrating said second difference signal as required to produce a signal representing a calculated value of the time deviation;

means for modifying said time deviation signal to produce a signal representative of the inadvertent interchange due to frequency deviation;

means for producing an area control error signal by combining said first difference signal with said second difference signal modified by the area frequency bias;



means for modifying the area control error signal to produce the improved area control error signal by adding to said area control error signal said inadvertent interchange signal modified by said weighting factor and subtracting said inadvertent interchange due to frequency deviation as modified by said weighting factor;

means for periodically updating said inadvertent interchange signal and said time deviation signal in accordance with more accurate measurements of those factors; and

means for modifying the generation in each area in response to the respective improved control error signals of the areas so as to reduce them toward zero to correct in each area for the inadvertent interchange and time deviation caused by the area.

4,419,734

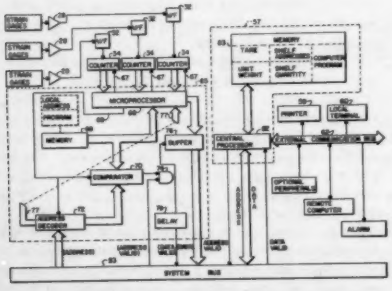
INVENTORY CONTROL SYSTEM

William Wolfson, Wayland; Jan W. Grondstra, Acton, and Curt Jarva, Hanover, all of Mass., assignors to Indata Corporation, W. Concord, Mass.

Filed Jan. 9, 1981, Ser. No. 223,749

Int. Cl.³ G06F 3/05; H04Q 1/22

U.S. Cl. 364—567 **26 Claims**



1. A physical inventory scanning and recording system comprising:

a plurality of storage stations each comprising (a) at least one platform for carrying articles and (b) support means supporting said platform at a plurality of mutually spaced locations;

said support means comprising a transducer adapted to generate an analog output gross weight signal varying in accordance with changes in the load on said support means presented by said platform and the articles carried by said platform;

voltage-to-frequency converter means responsive to the gross weight signals generated at said stations for producing digital output signals varying in accordance with said gross weight signals;

a computer adapted to store said digital signals and to provide signals representative of the number of articles carried by said platforms in accordance with the load values represented by said said digital output signals; and

scanning means for reading said digital output signals and applying said output signals to said computer.

4,419,735

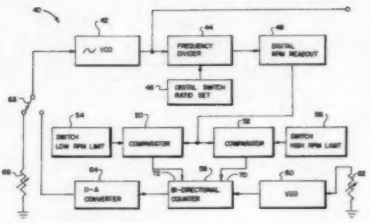
SIGNAL SOURCE FOR COMPRESSOR ANALOG

Morton E. Brown, San Antonio, Tex., assignor to Southern Gas Association, Dallas, Tex.

Filed Mar. 23, 1981, Ser. No. 246,288

Int. Cl.³ G06G 7/64; G06F 15/34; H03B 19/00

U.S. Cl. 364—803 **5 Claims**



4. In an electrical analog of a fluid pump, said analog having a plurality of diodes and a capacitor, an improved driving source for modelling a power input device, said driving source comprising:

a first voltage controlled oscillator having a control input, and an output coupled to a capacitor of the electrical analog;

a programmable frequency divider coupled to the output of said voltage controlled oscillator and having a programming input;

a digital frequency meter coupled to the output of said frequency divider;

means coupled to the programming input of said frequency divider for controlling the ratio between the input and output frequencies of said frequency divider;

a second voltage controlled oscillator;

means for varying the output frequency of said second voltage controlled oscillator;

a bi-directional counter coupled to the output of said second voltage controlled oscillator so that the output of said counter changes one increment for each output cycle of said second voltage controlled oscillator;

a digital to analog converter coupled to the output of said bi-directional counter and having an output coupled to the control input of said first voltage controlled oscillator so that the output frequency of said first voltage controlled oscillator is a function of the output of said digital to analog converter;

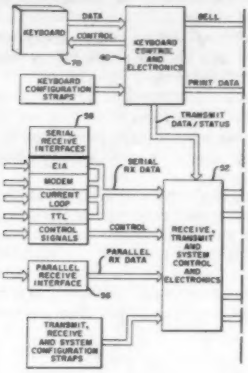
high and low limit switches for setting the maximum and minimum desired output frequency of said frequency divider; and,

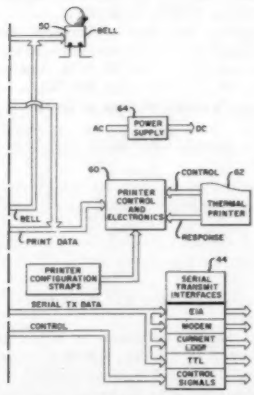
comparator means for changing the direction of the incremental changes in the output of said bi-directional counter when the output of said frequency divider reaches the desired maximum and minimum frequencies.

4,419,736
TELEPRINTER TERMINAL

Gay A. Christensen, Dayton, Ohio; Gerard Franco, and Theron L. Wildey, both of Ithaca, N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed May 12, 1980, Ser. No. 149,207
Int. Cl.³ G06F *3/00, 3/12*
U.S. Cl. 364—900 **12 Claims**



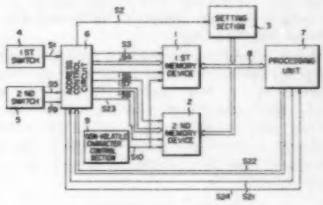


1. A teleprinter terminal system comprising a
printer mechanism, a
printer microprocessor for generating characters to be printed and operably associated with said printer mechanism for operating thereof,
communication means having an input comprising a parallel interface for receiving information and having an input-/output comprising separate serial interfaces for receiving and transmitting information, a
communications microprocessor operably associated with said communication means for operating thereof and for transmitting data to said printer microprocessor,
keyboard means operable to enter data for transmission thereof to said communications microprocessor for operation in one mode wherein data is output from said system and operable to enter data for transmission thereof to said printer microprocessor for operation in another mode wherein data is printed by said printer mechamism, a
keyboard microprocessor operably associated with said keyboard means for sensing said keyboard entered data and for transmitting said data to said printer microprocessor or to said communications microprocessor, a
first bus connected with said printer processor, with said communications processor and with said keyboard processor for interconnecting the three processors for transmitting data in dual exchanges whereby the three processors are connected for providing independent storage and release of data for the printing operation, and a
second bus connecting said communications processor and said keyboard processor for transmitting data in dual exchanges whereby the two processors are connected for providing independent storage and release of data for transmittal thereof from said system.

4,419,737
SETTING DEVICE FOR PROTECTIVE CONTROL SYSTEM

Mitsuru Yamaura, Hachioji; Ryotaro Kondow, Tokyo; Junichi Inagaki, Fuchu, and Kunio Matsuzawa, Sagamihara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 9, 1980, Ser. No. 157,340
Claims priority, application Japan, Jun. 15, 1979, 54-75375
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—900 **5 Claims**



1. A setting device for a protective control system comprising:
a data bus;
a setting unit provided for supplying to said data bus a setting value data required for an operation of said protective control system; and
a processing section connected to said data bus for receiving said setting value data so as to carry out a predetermined protective control operation according to a plurality of operating elements by using said setting value data;
wherein said setting unit comprises;
a setting section connected for supplying to said data bus said setting value set by an operator for each of said operating elements;
a first non-volatile memory connected to said data bus for storing said setting value;
a first switch for supplying to said first non-volatile memory a first write signal for each of said operating elements in response to an operation of the operator;
a first selector circuit;
a second selector circuit;
an address setting means for supplying to said first selector circuit an address output which is an address value of said first non-volatile memory corresponding to a designated operating element designated in accordance with a setting value set at the setting section by an operator; and
a second non-volatile memory connected to said data bus for storing said setting value;
said setting device further comprising a second switch for

supplying to a transfer control means a transfer signal in response to an operation of an operator after a set operation of an element requiring a setting value being set;

said transfer control means including;

an oscillator means for generating clock signals; and

a counter means supplied with said clock signals and said transfer signal for supplying to said first and second selector circuits, when said transfer signal is supplied thereto, a counter output having a value successively varying upon counting said clock signals and for delivering a first read signal and a second write signal, said first read signal being for reading said setting value of said first non-volatile memory for each vlue of said counter output and said second write signal being for writing said setting value of said first non-volatile memory read out by said first read signal into said second non-volatile memory;

said first selector circuit being adapted to receive said address output, counter output and transfer signal for delivering to said first non-volatile memory said counter output as a first address signal upon the receipt of said transfer signal and for delivering to said first non-volatile memory said address signal as said first address signal when no transfer signal is supplied to said first selector circuit;

said second selector circuit being adapted to receive said counter output, a third address signal delivered from said processing section and a second read signal for outputting to said second non-volatile memory said third address signal as a second address signal upon the receipt of said second read signal and for outputting to said second non-volatile memory said counter output as the second address signal when no second read signal is supplied to said second selector circuit;

said setting device further comprising a control means for monitoring the output of a power supply to deliver a non-volatile memory control signal to said first and second non-volatile memories;

said processing section comprising a programmed means for outputting said second read signal and said third address signal to receive from said data bus a plurality of said setting values stored in said second non-volatile memory, and for carrying out a predetermined protective control operation with respect to an operating element corresponding to said setting value by using said received setting values.

4,419,738

UNIT-PRICE PRESETTING METHOD FOR ELECTRONIC CASH REGISTERS

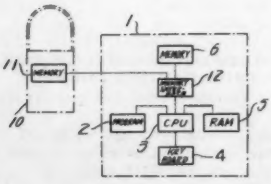
Yasuyoshi Takahashi; Shigeo Sakiguchi, and Teruyoshi Sato, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 96,197, Nov. 20, 1979, abandoned, which is a continuation of Ser. No. 807,304, Jun. 16, 1977, abandoned. This application Nov. 6, 1981, Ser. No. 318,815

Claims priority, application Japan, Jun. 16, 1976, 51-70788; Jun. 16, 1976, 51-70789

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—900 **2 Claims**



1. A method for presetting unit-price data corresponding to a plurality of commodity codes into a plurality of electronic cash registers, each register provided with a built-in memory for storing said unit-price data and keyboard means for presetting unit-price data into said built-in memory, said keyboard means including commodity keys and numeral keys, comprising:

providing each of said electronic cash registers with a portable memory input/output (I/O) connection and interface means for coupling unit-price data from said keyboard means to said I/O connection and from said I/O connection to said built-in memory;

connecting a portable memory unit to said portable memory I/O connection of at least one cash register;

setting unit-price data into the built-in memory of said at least one cash register and simultaneously in the portable memory unit connected thereto by means of an operation of said keyboard means;

sequentially transferring said portable memory unit from said at least one cash register to the I/O connection of others of said cash registers;

transferring unit-price data from said portable memory for storage in the built-in memory of each of said others of said cash registers when said portable memory is connected to the I/O connection of each of the others of said cash registers;

wherein said others of electronic cash registers to which are connected the electronic cash register portable memory unit for storing the unit-price data for each commodity code are provided with a transfer key such that upon operation of said transfer key the unit-price data in said portable memory unit is transferred therefrom to be stored in the memory of said others of said electronic cash registers.

4,419,739

DECENTRALIZED GENERATION OF SYNCHRONIZED CLOCK CONTROL SIGNALS HAVING DYNAMICALLY SELECTABLE PERIODS

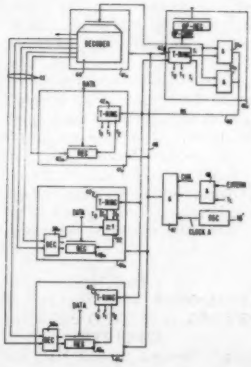
Arnold Blum, Gechingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 98,573, Nov. 29, 1979, abandoned. This application Jan. 25, 1982, Ser. No. 342,541

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 2853523

Int. Cl.³ G06F *9/00*

U.S. Cl. 364—900 **6 Claims**



1. Apparatus for generating clock control signals in a microprogrammed digital processing system having a plurality of circuitized chips, each of the chips having local switching points therein, said apparatus comprising:

(a) first circuit means, located on each chip requiring same,

for generating, when started, a fixed number of clock timing signals;

(b) master clock circuit means, operatively coupled to each of said first circuit means, for generating clock signals and for synchronously driving said first circuit means with respect to each other;

(c) second circuit means, operatively coupled to said first circuit means, for receiving and decoding operation codes of the micro instructions and for deriving OP-CODE control signals therefrom for use, in conjunction with said clock signals, in developing clock control signals for application to the switching points of each of the individual chips; and

(d) third circuit means responsive to said OP-CODES and operatively coupled to each of said first circuit means for generating a reset signal therefor to reset each of said first circuit means to their initial timing interval whenever the need arises at any point within a timing cycle to reduce the maximum number of clock timing signals provided per cycle by said first circuit means.

4,419,740

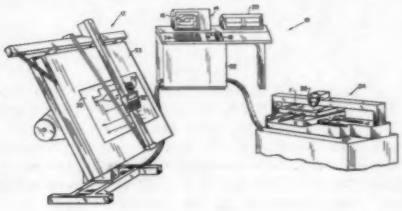
METHOD FOR STORING AND RETRIEVING DATA

Charles M. Hevenor, Jr., Bolton, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Division of Ser. No. 104,196, Dec. 17, 1978, Pat. No. 4,352,165. This application Apr. 19, 1982, Ser. No. 369,461

Int. Cl.³ G06F *3/13, 3/06, 13/06*

U.S. Cl. 364—900 **9 Claims**



1. In a data processing system, a method of recording data defining a graphic workpiece comprising:

dividing the graphic workpiece into a plurality of contiguous zones containing data to be entered into a memory, and associating each data entry with a respective single zone;

providing a data storage memory having a plurality of memory locations for receiving and storing said zoned data resulting from the division of the graphic workpiece;

dividing the plurality of said memory locations in the storage memory into groups of locations, and assigning a memory address to each group for identification; and

storing said data associated with any one zone of the graphic workpiece into a respective group of memory locations having a said assigned address for subsequent retrieval.

4,419,741

READ ONLY MEMORY (ROM) HAVING HIGH DENSITY MEMORY ARRAY WITH ON PITCH DECODER CIRCUITRY

Roger G. Stewart, Neshanic Station, N.J., and Moshe Mazin, Scotia, N.Y., assignors to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 116,313, Jan. 28, 1980, abandoned. This application Sep. 4, 1981, Ser. No. 299,343

Int. Cl.³ G11C *5/06, 17/06*

U.S. Cl. 365—72 **8 Claims**

1. A Read Only Memory (ROM) comprising a substrate

(A) a high density memory array including:

(1) a first plurality of substantially parallel lines of a semiconductor material of one conductivity type on said substrate,

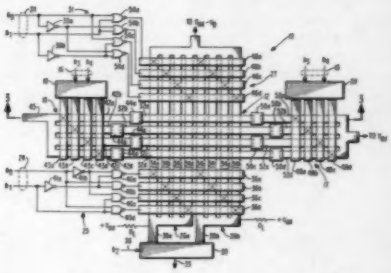
(2) a second plurality of substantially parallel lines of a material different from the semiconductor material of the first lines and said second lines crossing said first lines,

(3) insulating means between said first and second lines and having openings therethrough at some of the intersections of the first and second lines so that at said intersections the second line contacts the first line to form a diode;

(B) a line selector including:

(1) a first plurality of substantially parallel lines of the same semiconductor material as the first lines of the memory array and of a given conductivity type, said first lines being of a number equal to the number of the second lines of the memory array;

(2) a second plurality of substantially parallel conductive lines which are substantially perpendicular to and cross over the first lines of the selector, insulation between



said first and second selector lines at each of their intersections, and the portion of each of the first selector lines at each of said intersections being of a conductivity type opposite to that of said given conductivity type to form a MOS transistor with the second line at each of said intersections; and

(3) an output line connected to at least two of said first selector lines; and

(C) means electrically connecting each of the first selector lines to a separate one of the second memory array lines and along one side of the memory array, said connecting means being separate metal contacts each extending between and overlapping an end of a first selector line and an end of a second line of the memory array with said metal contacts being staggered in the direction in which the parallel lines extend in order to enable said metal contacts to overlap the ends of said lines while occupying the minimum space necessary in a direction substantially perpendicular to the direction in which said substantially parallel semiconductor lines extend.

4,419,742

SHIFT REGISTER FOR MAGNETIC DOMAIN PROPAGATION MEMORY

Claude Battarel, Magagnose, France, assignor to Crouzet, Paris, France

Filed Oct. 29, 1980, Ser. No. 201,738

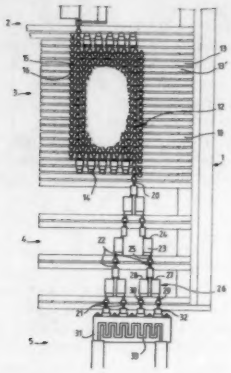
Claims priority, application France, Nov. 7, 1979, 79 27447

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—87 **15 Claims**

1. A storage register for propagating magnetic domains in a propagation channel comprising an insulating substrate, a soft magnetic layer overlying the insulating substrate, in which is formed the propagation channel, a hard magnetic layer overlying the soft magnetic layer, except in the areas defining the

propagation channel, an insulating layer overlying the soft and hard magnetic layers, a shift conduction layer in a Greek border pattern overlying the insulating layer, constituted by parallel segments perpendicular to the propagation channel, the propagation channel, comprising a writing box, upstream the propagation channel, a reading box, downstream the propagation channel, narrow zones for the storage of the domains, widened boxes for the growth of the domains, and a zone, upstream and adjacent the reading box, for the growth of the



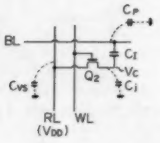
domains including intermediate boxes for increasing of the domains and, there between, zones for storing the domains, characterized in that the intermediate increasing boxes of the zone adjacent the reading box have a large surface compared to that of said widened boxes and comprise at least one lateral shoulder, said intermediate increasing boxes being not covered by the shift conduction layer, and means being provided for creating, at least at the level of said reading box and said zone adjacent the reading box, a pulsating external magnetic field.

4,419,743

SEMICONDUCTOR MEMORY DEVICE

Masao Taguchi, Sagamihara, and Takashi Ito, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 10, 1981, Ser. No. 282,266
Claims priority, application Japan, Jul. 18, 1980, 55-98426
Int. Cl.³ G11C *11/24*
U.S. Cl. 365—149 **11 Claims**



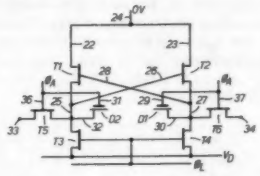
1. A semiconductor memory device comprising:
a reference potential line;
a plurality of bit lines;
a plurality of word lines;
dynamic cells, each of said dynamic cells comprising a capacitor having first and second electrodes, and a field effect type switching transistor, said dynamic cells arrayed at intersecting points of said plurality of bit lines and said plurality of word lines, one of the source electrode and the drain electrode of said field effect type switching transistor being connected to said reference potential line, the other of the source electrode and the drain electrode being connected to said first electrode of said capacitor, each of said plurality of bit lines being commonly connected to said second electrodes of said capacitors of said dynamic cells arrayed along each of said plurality of bit lines, each of said plurality of word lines being commonly connected to the gate electrodes of said field effect type switching transistors of said dynamic cells arrayed along each of said plurality of word lines, the first electrode of said capacitor extending from said other of the source electrode and the drain electrode of said field effect type switching transistor, over the gate electrode, to said one of the source electrode and the drain electrode of said field effect type switching transistor.

4,419,744

NON-VOLATILE STATIC RAM ELEMENT

Phillip Rutter, Plymstock, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Aug. 19, 1981, Ser. No. 294,358
Claims priority, application United Kingdom, Jan. 9, 1981, 8100592
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—154 **21 Claims**



1. A random access memory element comprising a pair of field effect transistors having source electrodes coupled to a reference potential and each having a drain electrode cross coupled to the gate electrode of the other transistor to form a flip-flop circuit; a load coupled to each field effect transistor; a semiconductor memory element coupled between the drain electrode of each transistor and a reference potential and wherein each memory element comprises a semiconductor substrate having a region of a first conductivity type provided with a diffused region of opposite conductivity type; a charge trapping dielectric layer overlying a surface portion of each of the diffused region and the region of first conductivity type; a gate electrode overlying the charge trapping dielectric layer and wherein the diffused region has a surface doping concentration such that the surface portion of the diffused region inverts in conductivity type when a predetermined amount of charge of a suitable polarity is trapped in the charge trapping dielectric layer and the concentration of charge of opposite polarity attracted to the inverted region approaches degeneracy.

4,419,745

SEMICONDUCTOR MEMORY DEVICE

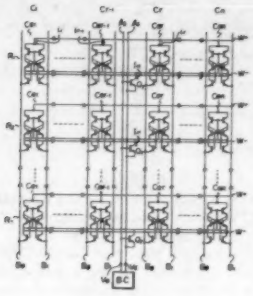
Kazuhiro Toyoda, Yokohama, and Chikai Ono, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 20, 1980, Ser. No. 179,793
Claims priority, application Japan, Aug. 30, 1979, 54-110719
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—174 **7 Claims**

5. A semiconductor memory device comprising:
a semiconductor substrate;
a plurality of word lines formed on said semiconductor substrate;
a plurality of injection-logic memory cells formed in said semiconductor substrate in a matrix form and commonly connected to each of said plurality of word lines;
current sources, respectively connected to said plurality of

word lines, only a single one of said current sources operatively connected at approximately the middle of a corresponding one of said plurality of word lines;

a bias circuit for providing a bias voltage to said current sources; and



only a single pair of bias lines, operatively connected between said bias circuit and said current sources, extending across the middle of each of said plurality of word lines and orthogonal to each of said plurality of word lines.

4,419,746

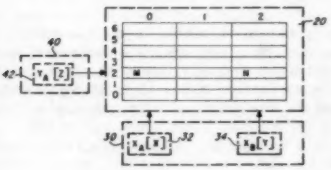
MULTIPLE POINTER MEMORY SYSTEM

Arthur C. Hunter, Lubbock, and Stephen P. Hamilton, Midland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 14, 1980, Ser. No. 196,808
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—189 **8 Claims**

ADDRESS LOCATION	LABLE	STATE
$X_A(0), Y_A(3) =$	AA=	00
$X_B(1), Y_B(1) =$	BB=	11
$X_A(0)\ Y_B(1) =$	AB=	01
$X_B(1)\ Y_A(3) =$	BA=	10

TABLE I



1. A memory system comprising:

a memory means for selectively storing and outputting data words in a plurality of memory locations in response to a received address signal indicative of a particular one of said memory locations;

a selection means for generating a particular one of a set of select signals; and

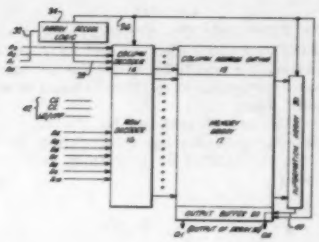
a plurality of address pointer registers coupled to said memory means and to said selection means each address pointer register for storing an address signal therein capable of addressing at least two locations anywhere in said memory means in response to receiving a corresponding select signal.

4,419,747

METHOD AND DEVICE FOR PROVIDING PROCESS AND TEST INFORMATION IN SEMICONDUCTORS

Larry T. Jordan, Pleasanton, Calif., assignor to Seeq Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 301,592, Sep. 14, 1981, abandoned. This application Feb. 5, 1982, Ser. No. 346,162
Int. Cl.³ G11C *17/00, 29/00*
U.S. Cl. 365—201 **20 Claims**



1. A device for providing a user with semiconductor processing and test information relating to a primary circuit disposed upon a semiconductor chip, said device comprising:

a programmable memory array having a plurality of storage locations disposed on the semiconductor chip adjacent the primary circuit;

addressing means for accessing selected individual storage locations in said plurality of storage locations;

programming means for programming semiconductor processing and test information into said selected storage locations accessed by said addressing means; and

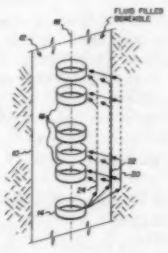
output means for providing output signals representative of the semiconductor processing and test information programmed into said selected individual storage locations accessed by said addressing means.

4,419,748

CONTINUOUS WAVE SONIC LOGGING

Robert W. Siegfried, II, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 222,433, Jan. 5, 1981, abandoned. This application May 5, 1983, Ser. No. 490,208
Int. Cl.³ G01V *1/40, 1/28*
U.S. Cl. 367—31 **5 Claims**



1. A sonic borehole logging system comprising:

a transmitting transducer for transmitting acoustic signals in a borehole,

transmitter means coupled to said transmitting transducer for causing said transmitting transducer to transmit a continuous sine wave signal at a preselected frequency,

a plurality of receiving transducers displaced linearly at a

plurality of preselected distances from said transmitting transducer, and

receiver sampling means coupled to said transmitter means and to said receiving transducers for recording only instantaneous samples of the amplitude of the acoustic signals received by said receiving transducers at times synchronized with a preselected point on each cycle of said continuous sine wave signal.

4,419,749

MAGNETIC REPRODUCING APPARATUS CAPABLE OF RECEIVING RADIO BROADCAST PROGRAMS

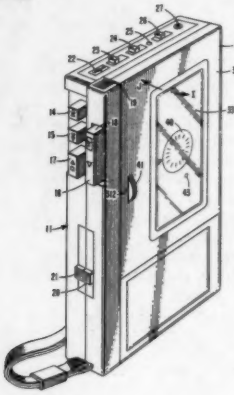
Yutaka Nokihara; Hironori Nakajyo, and Kimio Yoshida, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 17, 1981, Ser. No. 274,507

Claims priority, application Japan, Jul. 15, 1980, 55-96760

Int. Cl.³ G11B *31/00, 1/04;* **H04B** *1/08*

U.S. Cl. 369—11 **4 Claims**



1. Magnetic reproducing apparatus comprising a holding portion for insertion of a tape cassette, said holding portion including a pair of reel holders, a capstan and at least one first electrode, and a tuner unit to receive radio broadcast programs, said tuner unit being of substantially the same shape and size as said tape cassette and including a pair of first receiving portions on one side to receive said reel holders, a second receiving portion on said one side to receive said capstan, tuning means for varying the tuning frequency of said tuner unit, and at least one second electrode mounted on said tuner unit as an output terminal for said tuner unit to contact said at least one first electrode in response to insertion of said tuner unit in said holding portion, wherein said tuner unit further comprises control means positioned at the front of said tuner unit for controlling said tuning means, and said holding portion further comprises a cassette cover having a hole for manually operating said control means from outside said holding portion when said tuner unit is inserted in said holding portion.

4,419,750

CONSTANT TRACK WIDTH OPTICAL DISK RECORDING

Dennis G. Howe, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 13, 1981, Ser. No. 282,617

Int. Cl.³ G11B *7/00*

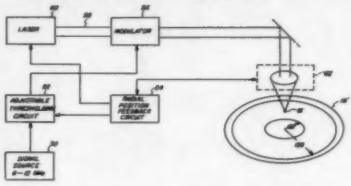
U.S. Cl. 369—111 **22 Claims**

1. A method for forming, on an optical disk, an information record that has a total fractional bandwidth greater than about 3 and a substantially constant track width, said method comprising the steps of:

(a) focusing a recording beam on the optical disk;

(b) providing relative movement between the optical disk and the recording beam focused thereon;

(c) modulating the recording beam to expose information marks of different lengths on the optical disk; and



(d) controlling (i) the size of the focused recording beam, (ii) the velocity of relative movement between the optical disk and the recording beam, and (iii) the modulation of the recording beam so that the maximum energy density received by the optical disk during exposure of the marks of information is approximately the same for all marks.

4,419,751

MULTIPORT MODEM AND THE USE THEREOF IN A METHOD AND A SYSTEM FOR TESTING A MULTILEVEL COMMUNICATION NETWORK

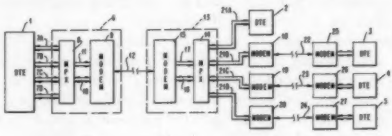
Jean Cholat-Namy, Juan-Les-Pins; Simon Huon, Roquefort-Les-Pins, and Philippe Thirion, Nice, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,794

Claims priority, application European Pat. Off., Nov. 28, 1980, 80430025.9

Int. Cl.³ H04J *3/14*

U.S. Cl. 370—13 **17 Claims**



1. A multiport modem suitable for use in a multilevel link and of the type comprising several input/output interfaces (7A-7D) that may respectively receive the bits of several data sub-channels, multiplexing means (**42, 43-46, 56**) for multiplexing together the data bits received through those of the interfaces which are active to form a single train of bits in accordance with a multiplexing configuration, and transmitter means (**75**) for sending said train of bits over a transmission channel, characterized in that it includes:

means (**36**) for detecting a test request received from one of the interfaces,

means (**30**) responsive to a test request to generate a test configuration code for identifying the interface that supplied said test request,

means (**11**) responsive to said test configuration code to cause said multiplexing means to assume a test configuration such that only that interface which received the detected test request will be active,

storage means (**73**) for storing a test command received at the interface that received the test request, said command including an indication of the test to be performed and a link level identifier,

decoder means (**74**) for decoding said link level identifier, and

means (67, 73) for applying the received test command and the test configuration code to said transmitter means for transmission over said channel if said link level identifier indicates a link level other than that which includes the modem.

4,419,752

CIRCUIT ARRANGEMENT FOR TRANSMITTING TWO SIGNALS OVER ONE LINE IN OPPOSITE DIRECTIONS

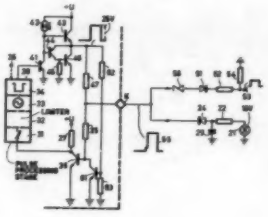
Paul Sonnenberger; Wilhelm Graffenberger, both of Hamburg, Fed. Rep. of Germany; Adriaan Cense, Wychen, Netherlands, and Petrus A. M. Van Westen, Oeffelt, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,200

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029054

Int. Cl.³ H04N *5/04*

U.S. Cl. 370—29 2 Claims



1. A circuit arrangement, having a first portion included within a semiconductor body and a second portion disposed outside said semiconductor body, for transmitting a first pulse-shaped signal from a first signal source in said second portion, via a connecting terminal of said semiconductor body, to a first receiving circuit in said first portion, and for transmitting a second pulse-shaped signal from a second signal source in said first portion, in the reverse direction via said connecting terminal, to a second receiving circuit in said second portion, characterized in that said circuit arrangement further comprises first switching means, comprising, in said second portion, a diode coupled between said first signal source and said connecting terminal, for coupling said first signal source to said first receiving circuit when said first pulse-shaped signal is to be transmitted to said first receiving circuit, and second switching means comprising, in said first portion, a first transistor having a base connected to said second signal source, an emitter connected to ground and a collector connected to a positive supply source via a current source, a second transistor having a base connected to the collector of said first transistor, a collector connected to said positive supply source, and an emitter coupled to said connecting terminal, a third transistor having a base also connected to the collector of said first transistor, an emitter connected to the emitter of said second transistor, and a collector coupled to ground, and a fourth transistor having a base connected to the collector of said third transistor, an emitter connected to ground, and a collector connected to the emitters of said second and third transistor, said first, second and fourth transistors being of the same conductivity type and opposite that of said third transistor, and in said second portion, a diode coupled between said connecting terminal and said second receiving circuit, for decoupling said second signal source from said second receiving circuit when said first switching means is conductive.

4,419,753

NETWORK CONNECTION SYSTEM

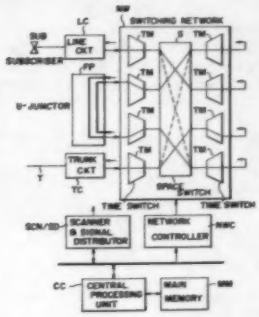
Takuhito Kojima, Yamato; Yasuo Satake, Kawasaki, and Toru Masuda, Fujisawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 1, 1980, Ser. No. 192,811

Claims priority, application Japan, Oct. 6, 1979, 54-129136

Int. Cl.³ H04J *3/06;* H04Q *11/04;* H04M *3/56*

U.S. Cl. 370—62 8 Claims



1. A network connection system for an electronic exchange of the time division system type or the space division system type, employing electronic contacts, the electronic exchange including a switching network having trunk lines and subscriber lines connected to subscribers, said network connection system comprising a U-junctor operatively connected to at least two trunk lines of the switching network of the electronic exchange, for selectively establishing an operable connection between at least two trunk lines, so that the U-junctor acts as a combination of an outgoing and an incoming trunk, the electronic exchange controlling the connection between the trunks, between subscribers or between each subscriber and each trunk by controlling both the switching network and the U-junctor.

4,419,754

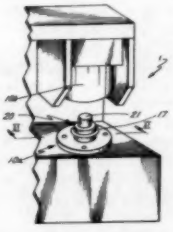
FURNACE ELECTRODE

George J Sitek, and Roger L. Bredeweg, both of Stevensville, Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Mar. 5, 1982, Ser. No. 355,212

Int. Cl.³ H05B *3/00*

U.S. Cl. 373—118 23 Claims



1. An electrode assembly for use on one or more electrodes of a resistance furnace used for heating resistive crucibles for the fusion of small analytical samples contained therein, said assembly comprising:

an electrically conductive electrode body having a surface facing generally toward a crucible to be heated by the electrode and shaped to receive an insert; and

an electrically conductive insert made of a wear-resistant

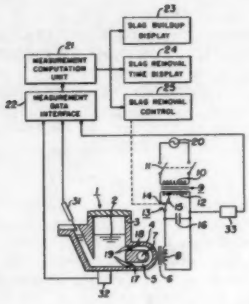
material and having a mating surface to said surface of said electrode, said assembly including collar means threadably engaging said electrode body for mechanically and removably securing said insert to said electrode in electrical contact therewith.

4,419,755

METHOD FOR MEASURING THE EXTENT OF SLAG DEPOSIT BUILDUP IN A CHANNEL INDUCTION FURNACE

Tsuguharu Ohmori, and Shizuo Hayashi, both of Suzuka, Japan, assignors to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Sep. 23, 1982, Ser. No. 421,909
Claims priority, application Japan, Sep. 29, 1981, 56-156887
Int. Cl.³ H05B 5/04
U.S. Cl. 373—145 **3 Claims**



3. A method for measuring the extent of slag deposit buildup in a channel induction furnace during operation, the furance including a container portion for holding molten metal, a channel portion in communication with the container portion and heating means for supplying power to heat metal in the channel portion, the heating means supplying power at a first level for maintaining the molten metal in the container portion at an operating temperature, the method comprising the steps of: during a first measurement interval when there are substantially no slag deposits in the furnace, increasing the power supplied by the heating means to a second level P_0 greater than the first level by a specified amount; measuring during the first measurement interval the quantities W_0, H_0, T_0 and N_0, where W_0 is the weight of molten metal in the furnace, H_0 is the time required for the molten metal in the container portion to rise by a predetermined amount above the operating temperature after the power supplied by the heating means is increased to P_0, T_0 is the operating temperature before the power supplied by the heating means is increased and N_0 is the first level of power supplied by the heating means during the first measurement interval; determining a first temperature rise factor S_0 according to the relationship $S_0=W_0/H_0$; during a second measurement interval at a selected time after the first measurement interval, increasing the power supplied by the heating means to a second level P_1 greater than the first level by a specified amount; measuring during the second measurement interval the quantities W_1, H_1, T_1 and N_1, where W_1 is the weight of molten metal in the furance, H_1 is the time required for the molten metal in the container portion to rise by a predetermined amount above the operating temperature after the power supplied by the heating means is increased to P_1, T_1 is the operating temperature before the power supplied by the heating means is increased and N_1 is the first level of power supplied by the heating means during the second measurement interval; determining a second temperature rise factor S_1 according to the relationship $S_1=W_1/H_1$; determining a corrected second temperature rise factor S_1' according to the relationship

$$S'_1 = \frac{P_o - (T_o/T_1)N_1}{P_1 - (T_o/T_1)N_1} S_1$$

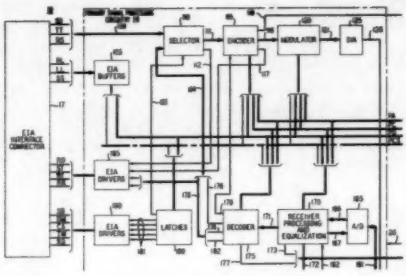
determining a quantity f indicative of the extent of slag buildup in the furnace during the second measurement interval according to the relationship $f=C(S_0-S_1')$ where C is a proportionality constant.

4,419,756

VOICEBAND DATA SET

Enrique Cheng-Quispe, Marlboro; Thomas M. Dennis, Ocean; Emanuel J. Fulcomer, Jr., Little Silver; George Malek, Wanamassa, and Shih Y. Tong, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 5, 1980, Ser. No. 156,869
Int. Cl.³ H04B 1/54; G06F 3/00
U.S. Cl. 375—7 **47 Claims**



1. A data set for processing data applied to said data set to generate transmit telephone voiceband data signals representing said data, said data set characterized by

signal processing means which includes a plurality of addressable registers,

a bus common to said registers, and

controller means for addressing said registers and for writing into each register via said bus at least a first associated information signal, the values of the information signals in said registers specifying the manner in which said data are to be processed,

said signal processing means further including circuit means distinct from said controller means for processing said data in accordance with said information signal values to generate said transmit telephone voiceband data signals, and means for applying said transmit telephone voiceband data signals to a telephone line.

4,419,757

TRANSFORMERLESS BIPOLAR CONVERTER

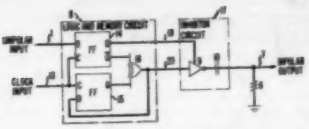
Cosmo H. De Gennaro, Long Valley, and Neil Hooper, Randolph Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 16, 1981, Ser. No. 244,297
Int. Cl.³ H03K 5/01
U.S. Cl. 375—17 **7 Claims**

1. Apparatus for converting a two-level input signal to a three-level output signal such that one of the two levels of the input signal is coded as the center level of the three levels and the other of the two levels of the input signal is coded alternately as one or the other of the outer levels of the output signal, the apparatus comprising;

means for alternately charging and discharging a capacitor through a load resistor responsive to successive occurrences of the other of the two levels of the input signal; and

means for inhibiting the charging or discharging of the capacitor through the load resistor responsive to the occurrence of the one of the two levels of the input signals,



the alternately charging and discharging means providing one or the other of the outer levels of the three level output signal across the load resistor,

the inhibiting means providing the center level of the three level output signal across the load resistor.

4,419,758

TRANSMISSION SYSTEMS FOR TRANSMITTING SIGNALS OVER POWER DISTRIBUTION NETWORKS, AND TRANSMITTERS FOR USE THEREIN

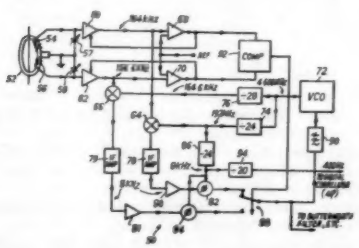
Howard A. Dorey, Godalming, England, assignor to Sangamo Weston Limited, Enfield, England

Filed Feb. 17, 1981, Ser. No. 235,277

Claims priority, application United Kingdom, Feb. 18, 1980, 8005454

Int. Cl.³ H04B 7/02

U.S. Cl. 375—38 **23 Claims**



1. A receiver for coupling to a power distribution network to receive a signal transmitted over the network and comprising at least two carrier signals having different frequencies and each modulated with a digital signal, at least a portion of the digital signal modulating each carrier signal representing the same message and the carrier frequencies being locked together, the receiver comprising:

input circuit means for receiving the modulated carrier signals;

means for sensing which of the first and second modulated carrier signals is being most strongly received;

variable frequency oscillator means; and

phase-locked loop means responsive to the sensing means to lock the frequency of said oscillator means to whichever of the first and second modulated carrier signals is being most strongly received and to demodulate at least that carrier signal to derive the digital signal therefrom, said phase-locked loop comprising:

means for deriving first and second intermediate signals from the first and second modulated carrier signals respectively, and third and fourth intermediate signals, substantially equal in frequency to the first and second intermediate signals respectively, from said oscillator means;

a first phase detector responsive to the first modulated carrier signal and a signal derived from the first and third intermediate frequency signals to produce a first output signal having a DC component dependent on the phase difference therebetween, said first output signal also containing said digital signal;

a second phase detector responsive to the second and fourth intermediate frequency signals to produce a second output signal having a DC component dependent on the phase difference therebetween, said second output signal also containing said digital signal;

low pass filter means; and

switching means responsive to the sensing means to apply to said oscillator means, via the low pass filter means, whichever of the first and second output signals corresponds to the modulated carrier signal being most strongly received, to vary the frequency of said oscillator means in the sense which tends to reduce the phase difference producing the output signal.

4,419,759

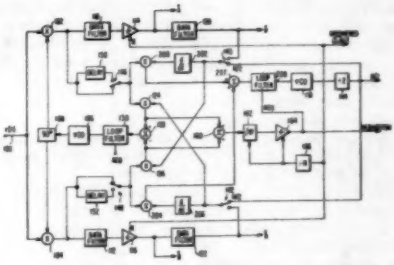
CONCURRENT CARRIER AND CLOCK SYNCHRONIZATION FOR DATA TRANSMISSION SYSTEM

John J. Poklemba, Ijamsville, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Aug. 5, 1980, Ser. No. 175,479

Int. Cl.³ H03L 7/06

U.S. Cl. 375—97 **16 Claims**



1. In an apparatus for deriving concurrent carrier and clock synchronization from a received signal, said received signal including at least a first carrier modulated with at least a first data signal, said apparatus including:

(a) a carrier recovery network for providing an estimated carrier signal comprising:

first mixing means for mixing said received signal with said estimated carrier signal and providing a first mixing means output;

data recovery means for sampling and comparing said first mixing means output to obtain an estimate of said at least first data signal;

second mixing means for combining said first mixing means output and said at least first data signal estimate and providing a carrier phase error signal as an output; and

first voltage controlled oscillator means for providing said estimated carrier signal in accordance with said carrier phase error signal; and

(b) a clock recovery network comprising:

differentiating means for receiving said at least first data signal estimate and providing as an output the time derivative thereof;

third mixing means for combining the outputs of said differentiating means and said first mixing means to obtain a clock phase error signal; and

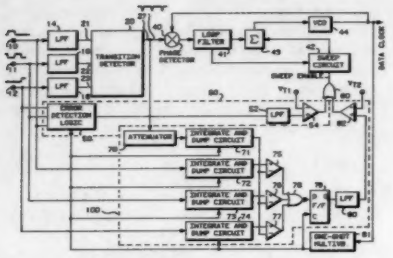
second voltage controlled oscillator means providing said estimated clock signal in accordance with said clock phase error signal, said estimated clock signal being provided as a sampling signal to said data recovery means.

4,419,760

AUGMENTED PHASE-LOCKED LOOP FOR VERY WIDE RANGE ACQUISITION AND METHOD THEREFOR

John E. Bjornholt, Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jan. 29, 1982, Ser. No. 344,150
Int. Cl.³ H03B 3/06
U.S. Cl. 375—120 7 Claims



1. A phase locked loop for use with a system of data communications having a plurality of transmission channels and providing a sequence of symbol signals along the plurality of channels such that no channel is used for the transmission of symbol signals twice in succession and such that the rising and falling transitions of a symobl signal on one of the plurality of channels respectively coincide with the falling transition of the signal on one other of the plurality of channels and the rising transition of a symbol signal on one other of the plurality of channels, comprising:

a plurality of channel inputs;

means for detecting the coincidental symbol signal transitions having a plurality of inputs coupled to said plurality of channel inputs and having an output;

means for controlling an oscillator having a first input coupled to said output of said means for detecting the coincidental symbol signal transitions, having a second input, having a third input and having an output;

an oscillator having an input coupled to said output of said means for controlling an oscillator having an output coupled to said third input of said means for controlling an oscillator; and

means for comparing the symbol signals with an oscillating signal and with the coincidental transitions of the symbol signals having a plurality of inputs coupled to said plurality of channel inputs, having an input coupled to said output of said means for detecting the coincidental symbol signal transitions, having an input coupled to said output of said oscillator, and having an output coupled to said second input of said means for controlling an oscillator.

4,419,761

SEQUENCE CONTROL SYSTEM

Yoshikazu Kuze, 31-3, Higashi Magome 1-chome, Ohta-ku, Tokyo, 143, Japan

PCT No. PCT/JP78/00001, § 371 Date Jun. 2, 1980, § 102(e) Date Jun. 2, 1980, PCT Pub. No. WO80/00756, PCT Pub. Date Apr. 17, 1980
PCT Filed Oct. 2, 1978, Ser. No. 201,065
Int. Cl.³ G06F 15/46, 3/05
U.S. Cl. 377—16 10 Claims

1. A sequence control system controlling the condition of a plurality of outputs comprising:

means for placing said system in a read mode;

clock pulse generating means for producing clock pulses;

presettable counter means for counting a preset number of clock pulses and producing an output timing pulse each time said preset number of clock pulses is accumulated;

binary counter means for counting the output timing pulses produced by said presettable counter means, said binary counter means accumulating a count representative of one cycle of system operation;

memory means operatively connected to and addressed by said binary counter means, said memory means storing zeros and ones data, the total number of zeros and ones representing a cycle of said control system being stored therein at respective addresses which correspond in number to a predetermined number of output pulses also representative of a cycle of said control system;

keyboard means for entering data representative of on and off durations of the outputs of said control system;

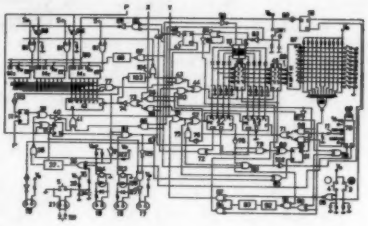
encoder means for converting said data entered into said keyboard means into a binary coded decimal signal;

shift register means for shifting said binary coded decimal signal produced by said encoder means into said presettable counter;

data switch means for entering said zeros and ones data;

a read start switch for activating the read mode;

first gate means responsive to actuation of said data switch means for enabling the shift of said binary coded decimal signal into said presettable counter;



second gate means responsive to actuation of said data switch means for enabling the counting operation of said binary counter means;

third gate means responsive to the operation of said presettable counter means, when in the read mode for disabling said second gate means when a number of pulses corresponding to the preset number of said presettable counter means have been accumulated therein;

fourth gate means operatively connected between the output of said binary counter means and said second gate means for disabling said second gate means after the number of output timing pulses corresponding to a full cycle have been generated by said binary counter means;

means operatively connected to said memory means for sequentially scanning respective addresses therein and for controlling said outputs based on the contents of said addresses;

said ones and zeros stored in said memory means being representative of the state of a respective output at a particular point during said cycle.

4,419,762

ASYNCHRONOUS STATUS REGISTER

Dieter G. Paul, Fullerton, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,404
Int. Cl.³ G11C 19/00
U.S. Cl. 377—66 18 Claims

1. An asynchronous status register comprising,

first bistable means connected to receive input signals,

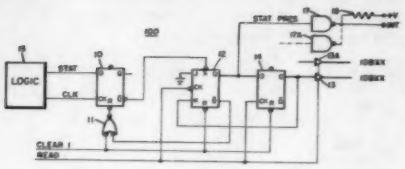
second bistable means connected to receive signals from said first bistable means,

third bistable means connected to receive signals from said second bistable means,

means connecting said second bistable means to said first bistable means to selectively reset said first bistable means,

means connecting said third bistable means to said second

bistable means to selectively change the state of said second bistable means, and



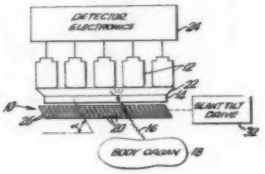
control means for supplying signals to said second and third bistable means to selectively permit operation thereof.

4,419,763

VARIABLE SLANTED CHANNEL COLLIMATOR

Eric G. Hawman, Buffalo Grove, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Jun. 1, 1981, Ser. No. 269,423
Int. Cl.³ G21F *5/04*
U.S. Cl. 378—149 **8 Claims**



1. A collimator for selectively varying the angle of view of a radiation detector with respect to a radiation source, comprising

a housing;

a plurality of apertured plates of radiation opaque material positioned within the housing so that corresponding apertures of adjacent plates are aligned to provide slanted channels for the transmission of radiation; and

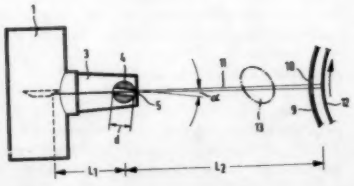
means for moving the plates relative to one another to change the degree of slant of the channels thereby varying the angle of view of the detector.

4,419,764

SLIT COLLIMATOR IN A PANORAMIC X-RAY APPARATUS

Ilmari Kinanen, Espoo, Finland, assignor to Instrumentarium Oy, Helsinki, Finland

Filed Sep. 21, 1981, Ser. No. 304,160
Claims priority, application Finland, Sep. 22, 1980, 802988
Int. Cl.³ A61B *6/14*; G21K *1/02*
U.S. Cl. 378—153 **7 Claims**



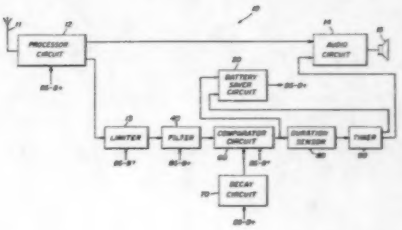
1. A slit collimator in a panoramic tomography X-ray apparatus for the collimation of an X-ray beam to a narrow fan-like beam and for controlling the tomographic layer thickness to be imaged, said collimator including a rotatable member provided with a collimating slit of substantial length relative to its width, said collimating slit allowing radiation penetration through said member, and rotating means for rotating said member around its longitudinal axis to at least two radiation penetration positions, wherein said slit has different effective widths to thereby control the radiation penetration through said member, said member being centrally journalled with regard to the width of said collimating slit.

4,419,765

SIGNAL ABSENCE DETECTOR

Keith H. Wycoff, 1205 N. Tyler St., Lexington, Nebr. 68850, and William H. Dittmer, Mesa, Ariz., assignors to Keith H. Wycoff, Lexington, Nebr.

Continuation-in-part of Ser. No. 84,460, Oct. 12, 1979, abandoned. This application Jul. 1, 1980, Ser. No. 165,212
Int. Cl.³ H04B *1/16*
U.S. Cl. 455—36 **59 Claims**



22. In a selective-call communication receiver of an incoming signal modulated by a predetermined code and having a processor circuit that may be rendered operative to process an incoming signal and prduce a processed signal including the code, the combination comprising a battery-saver circuit for periodically providing a supply voltage to render the processor circuit operative to process the incoming signal, and an absence detector having an input coupled to the processor circuit and having an output coupled to said battery-saver circuit, said absence detector including means for detecting whether or not said processed signal includes the predetermined code and for terminating the supply voltage as soon as detection is made that said processed signal does not include said predetermined code.

4,419,766

METHODS AND MEANS FOR PROVIDING IMPROVED AIR/GROUND RADIO TELEPHONE COMMUNICATIONS

John D. Goeken, Rt. 3, Plainfield, Ill. 60544, and Edward J. Henley, 13707 Sloan St., Rockville, Md. 20853

Filed Oct. 24, 1980, Ser. No. 200,557
Int. Cl.³ H04B *17/00, 7/26*
U.S. Cl. 455—62 **18 Claims**

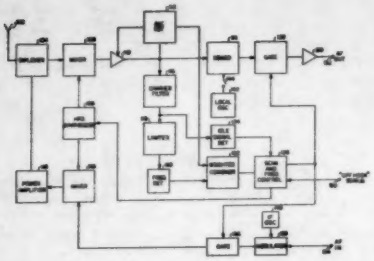
1. Aircraft radio telephone receiving means equipped with means for selecting the "best" signal from a group of signals transmitted from spaced ground stations based upon the signal strength and detected Doppler frequency error of the received signals from the spaced ground stations, comprising:

(a) means for operating the receiving means on the frequencies of the signals transmitted from said ground stations,

(b) means for measuring the signal strength of each of the received ground station's signals,

(c) means for measuring the polarity and magnitude of the Doppler frequency error of each of the ground station's signals, and,

(d) means for comparing the measurements of the ground stations' signals provided by (b) and (c) means so as to



enable said means for selecting to select "best" ground signal.

4,419,767

AUTOMATIC DIGITAL CONTROL DEVICE FOR EXACT FREQUENCY TUNING OF A RECEIVER

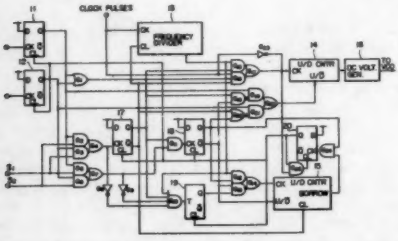
Minoru Motohashi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,705

Claims priority, application Japan, Nov. 27, 1980, 55-167096; Dec. 4, 1980, 55-171207

Int. Cl.³ H03J 7/22

U.S. Cl. 455—164 9 Claims



1. In a tuning frequency automatic control device of a receiver of the type comprising first frequency varying means for varying the tuning frequency of said receiver in a first direction at a first speed in response to a first instruction signal and detection means for detecting the tuning condition of said receiver and producing a first detection signal (S_1) when said receiver is detuned in one direction from a desired station and a second detection signal (S_2) when said receiver is detuned in another direction from said desired station, the improvement comprising:

second frequency varying means for varying the tuning frequency of said receiver for at least a first period of time in a second direction opposite to said first direction and at a second speed slower than said first speed in response to a second detection signal subsequent to a first detection signal:

third frequency varying means for varying said tuning frequency in said first direction at said second speed in response to a first detection signal subsequent to said subsequent second detection signal; and

halt signal generating means for halting the variation of said tuning frequency by said third frequency varying means after a second period of time which is half of said first period of time.

4,419,768

WIDEBAND TUNER FOR VHF, CATV AND UHF TELEVISION SIGNALS

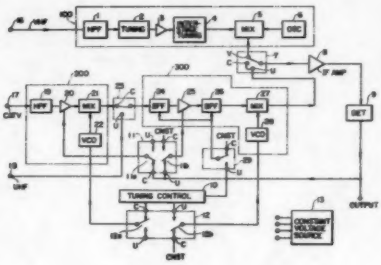
Sadahiko Yamashita, Sagamihara, and Mitsuo Saito, Kawasaki, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Sep. 29, 1981, Ser. No. 306,854

Claims priority, application Japan, Sep. 30, 1980, 55-137206; Oct. 1, 1980, 55-138162; Oct. 1, 1980, 55-138163; Oct. 8, 1980, 55-141698

Int. Cl.³ H04B 1/26, 1/16

U.S. Cl. 455—180 16 Claims



1. A wideband tuner having a plurality of manually controlled selector switches for operating the tuner in one of first, second and third reception modes, comprising:

first, second and third input terminals adapted to receive signals of low, medium and high frequency bands in response to said first, second and third reception modes, respectively;

a first tuning section coupled to receive signals of the low frequency band from said first input terminal for converting the received signals to a lower intermediate frequency for application to an intermediate frequency video amplifier;

a second tuning section coupled to receive signals of the medium frequency band from said second input terminal for converting the received signals to a higher intermediate frequency;

a third tuning section for converting an input signal applied thereto to said lower intermediate frequency;

first switching means for selectively coupling to said third tuning section the output of said second tuning section in response to said second reception mode or signals of the high frequency band from said third input terminal in response to said third reception mode; and

second switching means for selectivey coupling to said video amplifier the output of said first tuning section in response to said first reception mode or the output of said third tuning section in response to said second or third reception mode;

said second tuning section including a first differential mode modulator for modulating a first carrier at a manually controlled frequency higher than the frequency of a medium frequency band modulating signal in response to said second reception mode, and said third tuning section including a second differential mode modulator for modulating a second carrier at a frequency lower than said higher intermediate frequency in response to said second reception mode and modulating a third carrier at a manually controlled frequency higher than the frequency of a high frequency band modulating signal in response to said third reception mode.

4,419,769

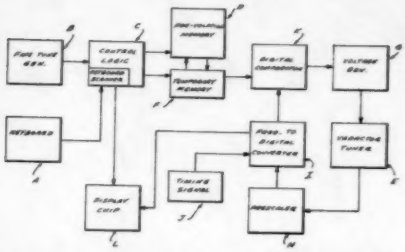
DIGITAL TUNING SYSTEM FOR A VARACTOR TUNER EMPLOYING FEEDBACK MEANS FOR IMPROVED TUNING ACCURACY

Elias Cohen, El Paso, Tex., assignor to General Instrument Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 191,676, Sep. 29, 1980, abandoned, which is a continuation of Ser. No. 52,074, Jun. 25, 1979, abandoned, which is a continuation of Ser. No. 903,956, May 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 664,710, Mar. 8, 1976, abandoned. This application Mar. 19, 1982, Ser. No. 359,767

Int. Cl.³ H04B 1/16

U.S. Cl. 455—182 11 Claims



1. A tuning system for use in a communications receiver or the like of the type having a signal controlled tuning element, said system comprising means for storing a plurality of first digital numbers representative of respective tuning frequencies, a signal selector, a temporary memory, means for addressing said storage means, in accordance with the actuation of said signal selector, to select one of said first digital numbers and transfer same to said temporary memory, user actuatable means for altering the contents of said temporary memory to provide a fine tuning adjustment, said altering means comprising an actuation member, said actuation member being rotatable, to alter the contents of said temporary memory, and displaceable to cause the contents of said temporary memory to be written into said storage means at said addressed location, means for sensing the frequency at which said element is tuned, means for converting said sensed frequency into a second digital number, means for comparing the contents of said temporary memory and said second digital number for generating a signal representative of the difference therebetween, and means, operably connected to said comparing means, for generating a tuning signal in accordance with said difference signal, said tuning signal being applied to said element to control same.

4,419,770

WRIST AM RADIO RECEIVER

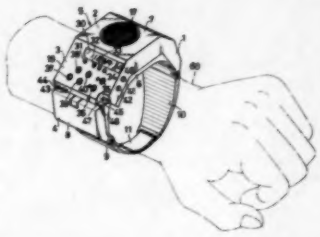
Hiroyuki Yagi, Iwaki, and Takashi Baba, Machida, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 372,189

Claims priority, application Japan, May 2, 1981, 56-67493; Feb. 19, 1982, 57-25523

Int. Cl.³ H04B 1/08

U.S. Cl. 455—301 16 Claims

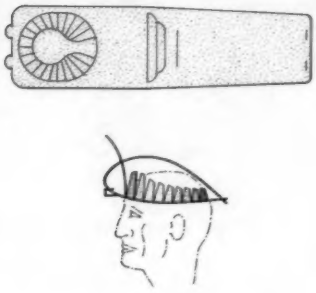


1. A wrist AM radio receiver comprising a bracelet-like structure adapted to be removably wrapped about a user's wrist, a bar antenna, a circuit board having thereon oscillating means forming a reference oscillation source, said bar antenna and said circuit board having oscillating means thereon being spaced apart within said bracelet-like structure in the direction in which the latter is wrapped, and at least a speaker also disposed in said bracelet-like structure between said bar antenna and said circuit board with oscillating means thereon so as to minimize the influence on said bar antenna of pulses from said reference oscillation source.

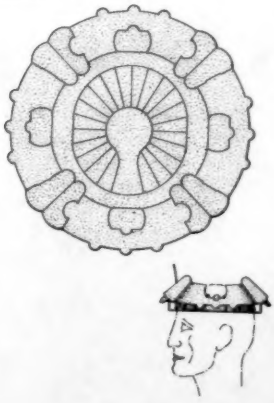
DESIGNS

DECEMBER 6, 1983

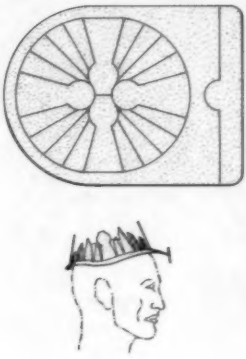
271,629
COVERED HAT
Rudy De Lozada, 84 Skyline Dr., Daly City, Calif. 94015
Filed Apr. 20, 1981, Ser. No. 255,612
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—253



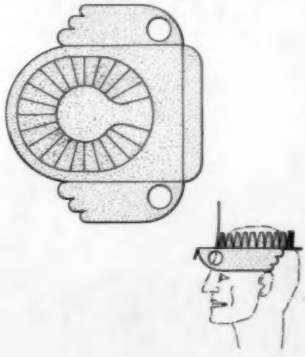
271,630
SPACE HAT
Rudy De Lozada, 84 Skyline Dr., Daly City, Calif. 94015
Filed Apr. 20, 1981, Ser. No. 255,614
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—253



271,631
SPECTATOR HAT
Rudy De Lozada, 84 Skyline Dr., Daly City, Calif. 94015
Filed Apr. 20, 1981, Ser. No. 255,615
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—253

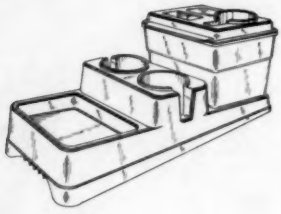


271,632
WINGED HAT
Rudy De Lozada, 84 Skyline Dr., Daly City, Calif. 94015
Filed Apr. 20, 1981, Ser. No. 255,613
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—253

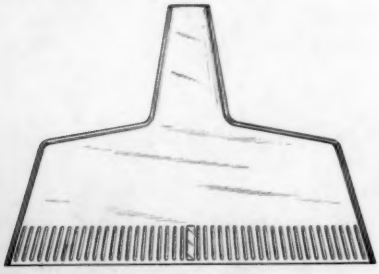


271,633
SPORT SHOE
Gino Casetta, Pontelongo, Italy, assignor to Simod Patents N.A.N.V., Curacao, Netherlands Antilles
Filed Nov. 12, 1980, Ser. No. 206,163
Claims priority, application Italy, May 16, 1980, 61932B/80
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

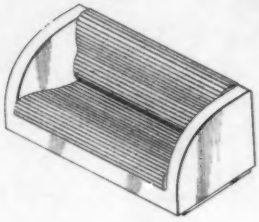
271,634
COMBINED SNACK TRAY AND LITTER BASKET FOR AN AUTOMOBILE
Gary L. Rockwell, 205 Willowcrest Way, LaGrange, Ga. 30240
Filed Feb. 12, 1982, Ser. No. 348,269
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D3—40



271,635
BROOM SHROUD
Charles E. Nichols, Woodridge, Ill., and David A. Jones, Kettering, Ohio, assignors to The Drackett Company, Cincinnati, Ohio
Filed Dec. 1, 1981, Ser. No. 326,312
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—04

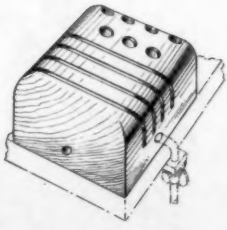


271,636
SOFA
Jan H. Matthias, Beverly Hills, Calif., assignor to Casa Bella Imports, Inc., Miami, Fla.
Filed Aug. 17, 1981, Ser. No. 293,398
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

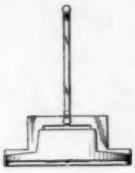


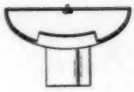
271,637
CHAIR
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate, Italy
Filed Apr. 13, 1981, Ser. No. 253,383
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

271,638
FLUSH MOUNTED DRAWING IMPLEMENT HOLDER
Tim Basaldua, Jr., 1911 W. Wabansia Ave., Chicago, Ill. 60622
Filed Jun. 15, 1981, Ser. No. 273,658
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—113

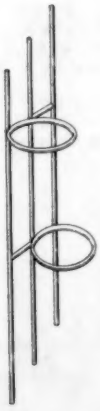


271,639
CAP HOLDER
Harry P. Capers, Jr., 9615 Richmond, Houston, Tex. 77063
Filed Jul. 6, 1981, Ser. No. 280,828
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—116

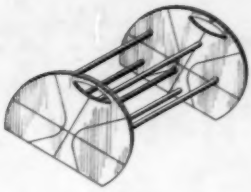




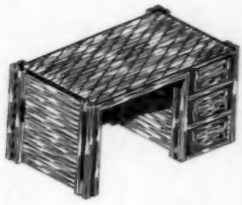
271,640
PLANT HANGER
Zoltan V. Gyebnar, 2340 Starr Ave., #3, Oregon, Ohio 43616
Filed Sep. 3, 1981, Ser. No. 299,040
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—137



271,641
SHOE RACK
Robert L. Bowsher, 212 19th Ave., Moline, Ill. 61265
Filed Jul. 27, 1981, Ser. No. 289,828
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—153

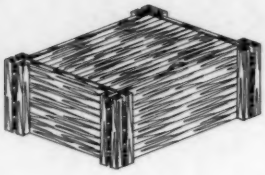


271,642
DESK
Robert V. Thompson, Boatyard Condominiums, 75th Ave. North, Myrtle Beach, S.C. 29577
Filed Apr. 23, 1981, Ser. No. 256,820
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—162

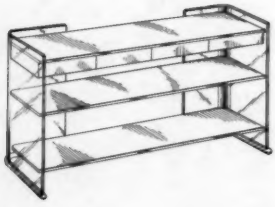


271,643
CHEST
Robert V. Thompson, Boatyard Condominiums, 75th Ave. North, Myrtle Beach, S.C. 29577
Filed Apr. 23, 1981, Ser. No. 256,802
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—165

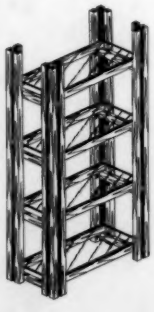
271,644
CHEST
Robert V. Thompson, Boatyard Condominiums, 75th Ave. North, Myrtle Beach, S.C. 29577
Filed Apr. 23, 1981, Ser. No. 256,920
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—167



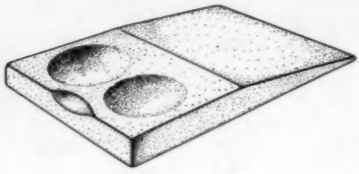
271,645
COMBINED SHELF AND STORAGE UNIT
Enrico Tonucci, Pesaro, Italy, assignor to Fiam s.r.l., Tavullia, Italy
Filed Mar. 17, 1981, Ser. No. 244,636
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—172



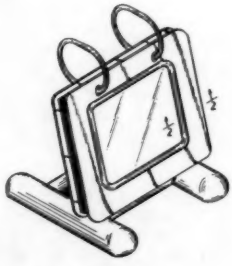
271,646
ETAGERE
Robert V. Thompson, Boatyard Condominiums, 75th Ave. North, Myrtle Beach, S.C. 29577
Filed Apr. 23, 1981, Ser. No. 256,796
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186



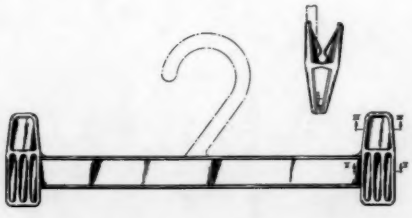
271,647
BODY TORSO SUPPORT PAD
Julia McLeod, 815 W. Bridge St., Yerington, Nev. 89447
Filed Jul. 22, 1981, Ser. No. 285,327
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



271,648
PHOTOGRAPH DISPLAY
Vincent Di Bartolo, Cresskill, N.J., assignor to Mateflex/Mele Corporation, Utica, N.Y.
Filed Nov. 9, 1981, Ser. No. 319,699
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



271,649
BODY OF A GARMENT HANGER
John H. Batts, East Grand Rapids, and Bredeveg, Robert, Zeeland, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.
Filed Jul. 6, 1981, Ser. No. 280,338
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—253



271,650

EMBOSSED BEVERAGE OR PACKAGING CUP

Van D. Groenewold; Hubert E. Christian, and James P. Schwartz, all of Phoenix, Ariz., assignors to WMF Container Corporation, Phoenix, Ariz.

Continuation of Ser. No. 29,799, Apr. 13, 1979, abandoned. This application Sep. 3, 1981, Ser. No. 299,238

The portion of the term of this patent subsequent to May 25, 1996, has been disclaimed.

Term of patent 14 years

Int. Cl. D07—*01;* D09—*03*

U.S. Cl. D7—6

271,651

SCALLOPED BOWL

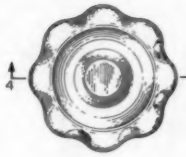
Lawrence M. Knutson, Prior Lake, Minn., assignor to Decra Stone, Inc., Prior Lake, Minn.

Division of Ser. No. 97,165, Nov. 26, 1979, abandoned, which is a division of Ser. No. 873,965, Jan. 31, 1978, Pat. No. Des. 263,668. This application Nov. 12, 1981, Ser. No. 320,226

Term of patent 14 years

Int. Cl. D07—*01*

U.S. Cl. D7—29



271,652

ACID-ETCHED PATTERN FOR GLASSWARE

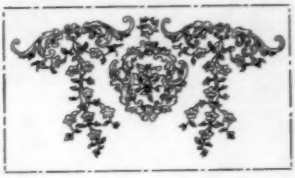
Jon R. Suffell, Glen Dale, W. Va., assignor to Lenox Crystal, Incorporated, Lawrenceville, N.J.

Filed Jun. 16, 1981, Ser. No. 274,123

Term of patent 14 years

Int. Cl. D07—*01*

U.S. Cl. D7—39



271,653

STEM AND A BASE OF A BOWL OF A STEMWARE GLASS

Michael Boehm, Selb, Fed. Rep. of Germany, assignor to Rosenthal Aktiengesellschaft, Fed. Rep. of Germany

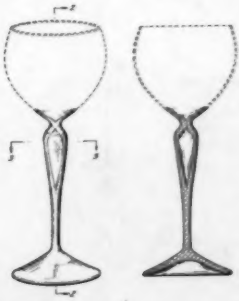
Filed Aug. 17, 1981, Ser. No. 293,343

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 7043

Term of patent 14 years

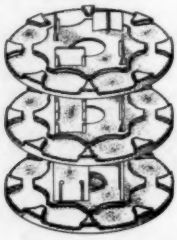
Int. Cl. D07—*01*

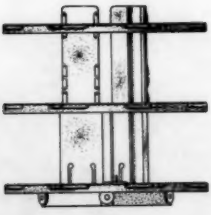
U.S. Cl. D7—39



271,654
ICE-SPOON
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Dec. 22, 1981, Ser. No. 333,437
Claims priority, application Hague, Jun. 26, 1981, 71 564
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—47

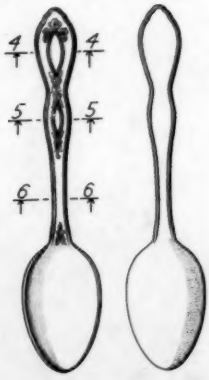
271,655
ROTATABLE RACK FOR FOOD JARS OR THE LIKE
Jody L. Numbers, Scottsdale, Ariz., assignor to Monterey Laboratories, Inc., Las Vegas, Nev.
Filed Jun. 26, 1981, Ser. No. 277,702
Term of patent 14 years
Int. Cl. D7—*07*; D6—*04*
U.S. Cl. D7—71





271,656
CAVIAR-SPOON
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Dec. 22, 1981, Ser. No. 333,438
Claims priority, application Hague, Jun. 26, 1981, 71 564
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—104

271,657
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.
Filed Feb. 9, 1982, Ser. No. 347,118
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

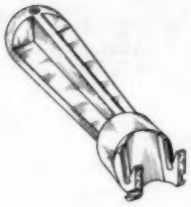


271,658

MOUNTING TOOL FOR A GUIDE TUBE FOR CABLES IN A FIRE WALL

Bengt E. Legerius, Nyköping, and Hans W. Siebert, Oxelösund, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sep. 5, 1980, Ser. No. 184,231
Claims priority, application Sweden, Mar. 14, 1980, 80-0537
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14



271,659

COMBINATION POCKET TOOL

Paul R. Fayle, P.O. Box 1121, Lexington, Va. 24450

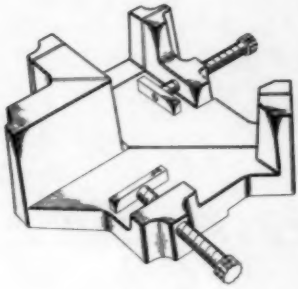
Filed Oct. 22, 1979, Ser. No. 87,461
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—18

271,660

MOLDED FRAME MAKER MITRE BOX WITH CLAMPS

I. James Elmore, Simsbury, and Robert F. West, West Simsbury, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Oct. 21, 1981, Ser. No. 313,684
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



271,661

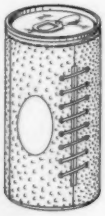
CLOSURE DEVICE

Ted Stark, Jersey City, N.J., assignor to M&M Luggage Co., Inc., Jersey City, N.J.

Filed Apr. 9, 1981, Ser. No. 252,478
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—339

271,662
DECK PLATE
Ben S. Jones, 16173 Notre Dame, Mount Clemens, Mich. 48043
Filed Dec. 11, 1981, Ser. No. 329,678
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—399

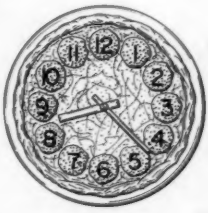
271,663
BEVERAGE CAN
John F. Stark, Satellite Beach, and Ronald W. Morrison, Ormond Beach, both of Fla., assignors to Starmax, Inc., Satellite Beach, Fla.
Filed Nov. 3, 1980, Ser. No. 203,383
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—307



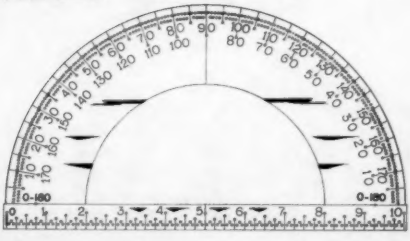
271,664
COMBINED TYPEHEAD CONTAINER AND TYPEHEAD
George T. Cowan, Jr., Winchester, and Robert E. Griffith, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 5, 1981, Ser. No. 260,619
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—337

271,665
CONTAINER FOR LIQUIDS OR THE LIKE
Paul D. Garwood, Delran; Delmar F. Macaulay, Moorestown, and Ernst J. Schmid, Cinnaminson, all of N.J., assignors to Campbell Soup Company, Camden, N.J.
Filed Aug. 11, 1982, Ser. No. 407,304
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

271,666
PIZZA FACED CLOCK
Molly K. Flemate, 1447 Colt Way, San Jose, Calif. 95121
Filed Oct. 26, 1981, Ser. No. 315,239
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—6

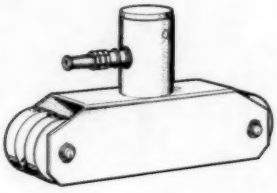


271,667
PROTRACTOR
Fahim R. Sidrak, 4649 Norwich Rd., Wilmington, N.C. 28405
Continuation-in-part of Ser. No. 118,671, Feb. 5, 1980. This application Oct. 20, 1981, Ser. No. 313,308
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65

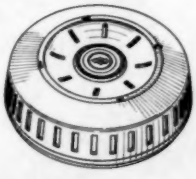


271,668
VOLTAGE DETECTOR
Masao Tanaka, Ichikawa, Japan, assignor to Kabushiki Kaisha Carmate, Tokyo, Japan
Filed Nov. 2, 1981, Ser. No. 317,454
Claims priority, application Japan, Jun. 16, 1980, 55-23979
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

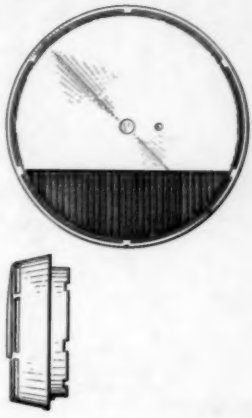
271,669
CABLE TENSION SENSOR
Hakan Öhrnell, and Leif Näslund, both of Karlstad, Sweden, assignors to Handelsbolaget Öhrnellteknik, Karlstad, Sweden
Filed Oct. 8, 1981, Ser. No. 309,797
Claims priority, application Sweden, Apr. 7, 1981, 81-0910
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—83



271,670
FIRE AND SMOKE DETECTOR
Nobuei Takai, and Katsura Yamamoto, both of Tokyo, Japan, assignors to Nittan Company, Limited, Tokyo, Japan
Filed Jun. 22, 1981, Ser. No. 276,321
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

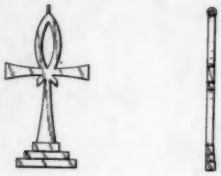


271,671
SMOKE DETECTOR
Hugh P. Thornton, Jr., Acton, Mass., assignor to American District Telegraph Company, Jersey City, N.J.
Filed Nov. 9, 1981, Ser. No. 319,149
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

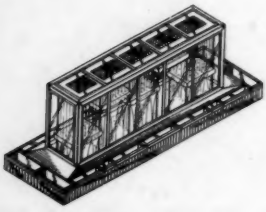


271,672
BRACELET
Gianni Bulgari, Rome, Italy, assignor to Ditta Sotirio Bulgari di Costantino e Giorgio Bulgari S.a.s., Rome, Italy
Filed Feb. 5, 1982, Ser. No. 346,336
Claims priority, application Italy, Aug. 7, 1981, 35958/81[U]
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—5

271,673
RELIGIOUS MEDAL
Dale T. Vick, 1731 N. Holyoke, Wichita, Kans. 67208
Filed Jan. 27, 1982, Ser. No. 343,382
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—96

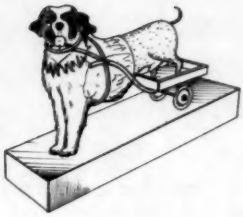


271,674
KINETIC SCULPTURE
Hugh T. Greenlee, Gates Mills, and Roy P. Hess, Vermilion, both of Ohio, assignors to W. R. Grace & Co., New York, N.Y.
Filed Jul. 1, 1981, Ser. No. 279,479
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131



271,675
FLORAL ARRANGEMENT BASE
Melvin R. Nichols, 3017 Monticello, Dallas, Tex. 75205
Filed Aug. 10, 1981, Ser. No. 291,561
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—147

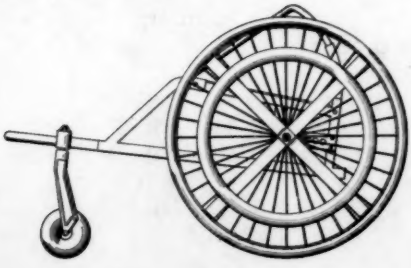
271,676
WHEELED DOG STATUETTE
James R. Ivy, 9001 Glacier, Apt. 138, Texas City, Tex. 77590
Filed Feb. 6, 1981, Ser. No. 232,381
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158



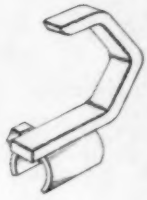
271,677
DOG STATUETTE
James R. Ivy, Apt. 138, 9001 Glacier, Texas City, Tex. 77590
Filed Feb. 6, 1981, Ser. No. 232,382
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

271,678
FLAG
Dale R. Hemphill, 1435 Fallcreek Dr., Mishawaka, Ind. 46544
Continuation-in-part of Ser. No. 330,150, Dec. 14, 1981, abandoned. This application May 17, 1982, Ser. No. 378,525
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—173

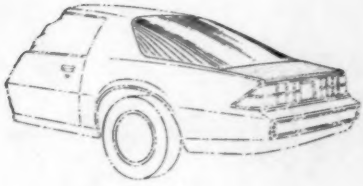
271,679
WHEELCHAIR
Jeffrey P. Minnebraker, Westlake Village, Calif., assignor to Quadra Wheelchairs, Inc., Westlake Village, Calif.
Filed Mar. 24, 1981, Ser. No. 246,999
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131



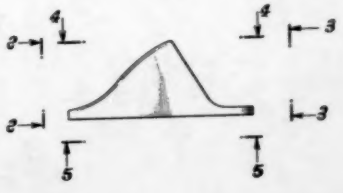
271,680
VEHICLE CARRIER ATTACHMENT
Nikolas K. Boshco, 2866 Verde Vista Dr., Santa Barbara, Calif. 93105
Filed Jul. 17, 1981, Ser. No. 284,357
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



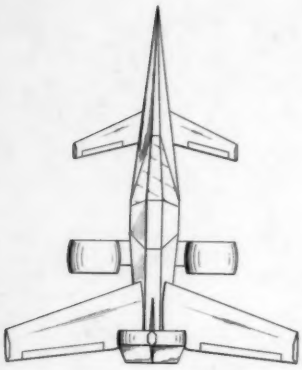
271,681
COMBINED REAR WINDOW AND TRUNK LID FOR AN AUTOMOBILE
Roger E. Hughet, West Bloomfield, and Jerry P. Palmer, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 4, 1981, Ser. No. 231,004
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—183



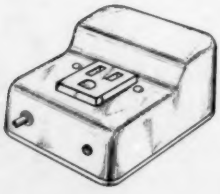
271,682
MARINE VENTILATOR FITTING
Alexander S. O. MacDougall, 495 Valley Club Rd., Santa Barbara, Calif. 93108
Filed Nov. 16, 1981, Ser. No. 321,467
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—317



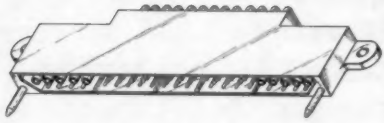
271,683
VERTICAL TAKEOFF AND LANDING AIRCRAFT
Robert T. Clifton, Houston, Tex., assignor to Dyna Con Tech Corporation, South Houston, Tex.
Filed Aug. 21, 1981, Ser. No. 295,224
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—326



271,684
COMBINED CONDUCTIVITY MONITOR AND CONTROLLER
William J. Berry, Jr., Durham, N.C., assignor to Darco Water Systems, Inc., Durham, N.C.
Filed Mar. 10, 1980, Ser. No. 128,634
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—11

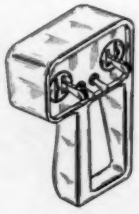


271,685
MULTI-CONTACT ELECTRICAL CONNECTOR PLUG
Albert Casciotti, Hershey, and Robert D. Hollyday, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Dec. 28, 1981, Ser. No. 335,046
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



271,686
MIXED TERMINAL ELECTRICAL CONNECTOR PLUG
Albert Casciotti, Hershey, and Robert D. Hollyday, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Dec. 28, 1981, Ser. No. 335,047
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

271,687
REMOTE CONTROL HANDLE FOR CRANE
Edward E. Griffiths, 6499 Trinidad Dr., San Jose, Calif. 95120
Filed Dec. 5, 1979, Ser. No. 100,701
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



271,688

PRE-RECORDED CARTRIDGE VIDEO/AUDIO DISK

Osamu Tajima, Ayase; Takashi Yamamura, Yokohama; Masafumi Mochizuki, Yamato, and Yoichi Mita, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

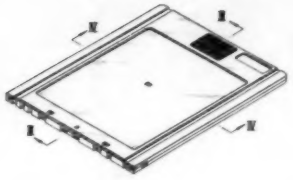
Continuation-in-part of Ser. No. 166,781, Jul. 7, 1980. This application Jul. 15, 1981, Ser. No. 283,624

Claims priority, application Japan, Feb. 1, 1980, 55-14482

Term of patent 14 years

Int. Cl. D14—*99*; D16—*99*

U.S. Cl. D14—11



271,689

TELEPHONE UNIT

Armand J. Gerniers, Mariakerke, Belgium, assignor to GTE ATEA, Herentals, Belgium

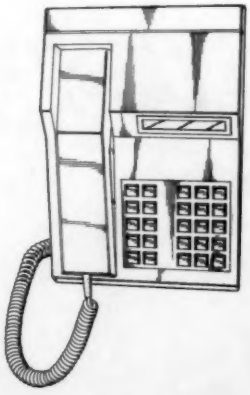
Filed Jan. 21, 1981, Ser. No. 226,637

Claims priority, application Benelux, Jul. 22, 1980, DM/0OO277

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—58



271,690

TELEPHONE SUPPORT

Ron Strobel, 2345 NW. Market Pl., Bend, Oreg. 97701

Filed Jan. 26, 1981, Ser. No. 228,216

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—60

271,691

TELEPHONE STAND

Ghanshyam A. Bhat, Marlboro; Donald M. Genaro, Haworth, both of N.J.; John N. McGarvey, Drexel Hill, Pa.; Albert C. Stickler, Little Silver, N.J.; Gordon E. Sylvester, Jamaica, N.Y., and Daniel W. Tyler, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 5, 1981, Ser. No. 308,507

Term of patent 14 years

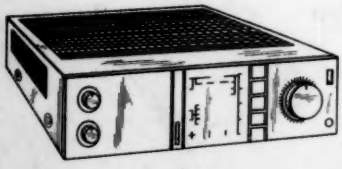
Int. Cl. D14—*03*

U.S. Cl. D14—60

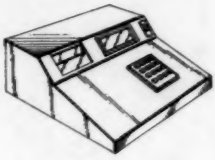
271,692
CASING FOR AUDITORY TRAINER RECEIVER
Wayne E. Morris, Brooklyn Park, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.
Filed Dec. 8, 1980, Ser. No. 213,854
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—70

271,693
TELEPHONE HANDSET
Bayard F. Kessler, Novation, Inc., 20409 Priarie, Chatsworth, Calif. 91311
Filed Sep. 1, 1981, Ser. No. 298,281
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—63

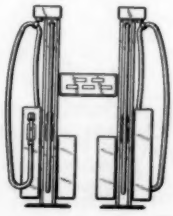
271,694
AUDIO AMPLIFIER
Toshihito Nomura, and Hirotaka Imai, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Jul. 8, 1981, Ser. No. 281,262
Claims priority, application Japan, Jan. 9, 1981, 56-274
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96



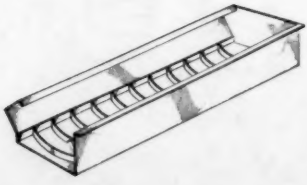
271,695
MICROCOMPUTER ANALYZER
James C. Tuma, Minneapolis, and Donald A. Purland, New Hope, both of Minn., assignors to MRM Computers, Inc., Minneapolis, Minn.
Filed Sep. 14, 1981, Ser. No. 301,511
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106



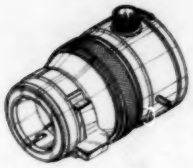
271,696
MULTI-PRODUCT FUEL DISPENSER
John A. Todd, Salisbury, Md., assignor to Dresser Industries, Inc., Dallas, Tex.
Division of Ser. No. 952,166, Oct. 17, 1978, Pat. No. Des. 260,897. This application Apr. 23, 1981, Ser. No. 256,290
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—9.2



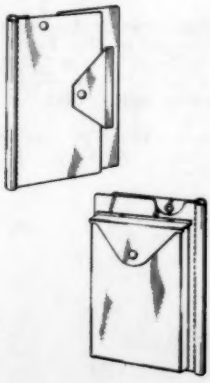
271,697
TRAY FOR A MECHANICAL PRECIOUS METAL RECOVERY DEVICE
James L. Weir, Camarillo, Calif., assignor to Au Equipment Associates, Ltd., Westlake Village, Calif.
Filed Nov. 23, 1981, Ser. No. 324,383
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—147



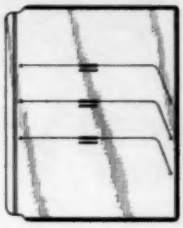
271,698
RING FOR COUPLING CAMERA TO ENDOSCOPE
Yoshio Shishido, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Apr. 8, 1981, Ser. No. 252,073
Claims priority, application Japan, Oct. 8, 1980, 55-41981
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—38



271,699
HOLDER FOR A RULE BOOK AND SCORE CARD
Roy C. Draddy, 9 Dunfries Pl., Floreat Park, Australia
Filed Jan. 30, 1980, Ser. No. 230,283
Claims priority, application Australia, Aug. 4, 1980, 81698
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26

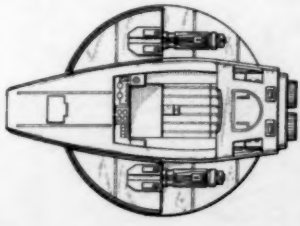


271,700
HOLDER FOR FLOPPY DISCS
Donald L. Boughner, Churchville, and John M. Quincey, Pavilion, both of N.Y., assignors to BOK Plastics, Inc., Leroy, N.Y.
Filed May 18, 1981, Ser. No. 264,471
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—33



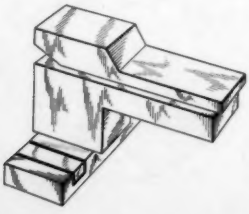
271,701
PLAYING CARD
Frank J. Wirken, Overland Park, Kans., assignor to Jack-Poker, Ltd., Kansas City, Mo.
Filed Jun. 5, 1981, Ser. No. 270,605
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—42

271,702
SPACESHIP TOY
Kenneth R. Wilkes, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 4, 1982, Ser. No. 345,742
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87

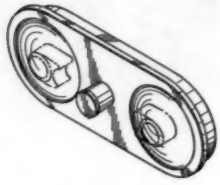


271,703
DOLL
Brian R. Pennington, 2408 Shawnee Dr., Great Bend, Kans. 67530
Filed Nov. 30, 1981, Ser. No. 325,740
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

271,704
FAUCET
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Jun. 17, 1981, Ser. No. 274,581
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23



271,705
COMBINED ESCUTCHEON AND DIVERTER VALVE CONTROL FOR BATHTUB/SHOWER UNITS
Wolfgang Fabian, Mannheim, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 92,874, Nov. 9, 1979. This application May 14, 1982, Ser. No. 378,363
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 79/3
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—26



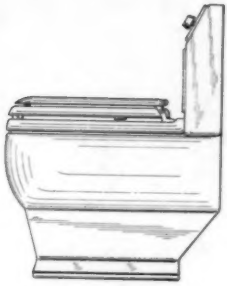
271,706
SPOUT
Wolfgang Fabian, Mannheim, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 92,874, Nov. 9, 1979. This application May 14, 1982, Ser. No. 378,366
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1979, 79/3
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—32

271,707

SEWERLESS TOILET OR SIMILAR ARTICLE

Kenneth J. De Graw, Montvale, and Earl W. Nickerson, Ocean City, both of N.J., assignors to American Standard Inc., New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,267
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

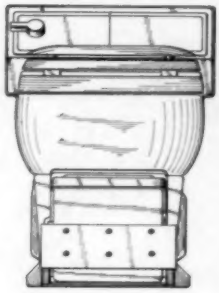


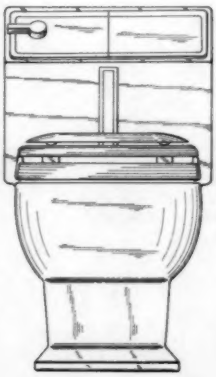
271,708

SEWERLESS TOILET OR SIMILAR ARTICLE

Kenneth J. DeGraw, Montvale, and Earl W. Nickerson, Ocean City, both of N.J., assignors to American Standard Inc., New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,268
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48



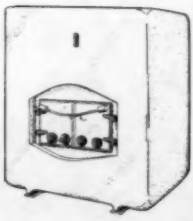


271,709

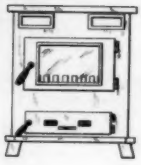
WOOD FUELED WATER HEATER OR THE LIKE

Fred R. Snow, Jr., Box 77, Rte. 3, Dobson, N.C. 27017

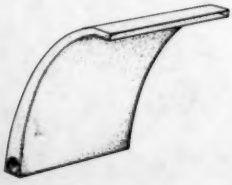
Filed Dec. 2, 1981, Ser. No. 326,672
Term of patent 14 years
Int. Cl. D23—*97*
U.S. Cl. D23—86



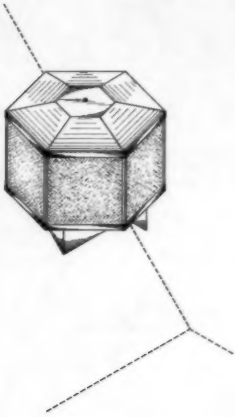
271,710
STOVE
Richard A. Russo, Abington, Mass., assignor to Russo Manufacturing Corp., Randolph, Mass.
Filed Aug. 3, 1981, Ser. No. 289,785
The portion of the term of this patent subsequent to Mar. 23, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



271,711
FIREPLACE HEAT EXCHANGER
Allen L. Stewart, P.O. Box 241, Clayton, N.C. 27520
Filed May 26, 1981, Ser. No. 267,030
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136

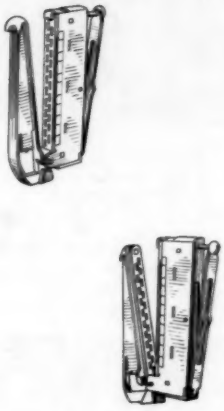


271,712
EVAPORATIVE COOLER
Kaywood R. Rodgers, and Myrtle H. Rodgers, both of 712 E St., Taft, Calif. 93268
Filed Dec. 19, 1980, Ser. No. 218,425
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139

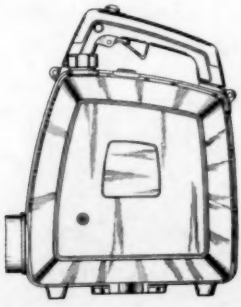


271,713
COMBINED STARTER VENT AND WATER SHEDDING VENTILATION STRIP
Robert M. Hicks, 124 Main St., Westford, Mass. 01886
Filed Mar. 24, 1980, Ser. No. 133,542
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151

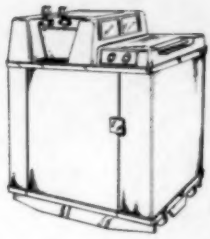
271,714
DISPOSABLE STAPLE CARTRIDGE FOR LINEAR CLOSURE SURGICAL STAPLER
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Jul. 2, 1981, Ser. No. 279,681
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27



271,715
PORTABLE BLOWER
Katsumi Kiyooka, Warabi, Japan, assignor to Komatsu Zenoah Co., Tokyo, Japan
Filed Mar. 20, 1981, Ser. No. 229,292
Claims priority, application Japan, Jul. 31, 1980, 55-30853
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—15



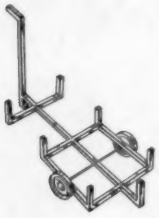
271,716
BEVERAGE CART
G. Merle Bachmann, Stone Mountain; Charles L. Davis, Atlanta, and Samuel C. Crosby, Decatur, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Mar. 2, 1981, Ser. No. 239,690
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—14



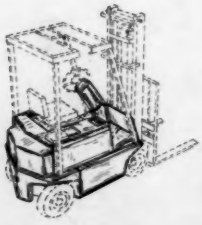
271,717
ELEVATED CREEPER FOR AUTOMOTIVE MECHANICS
Clarence W. Linn, 1501 Academy, Lodi, Calif. 95240
Filed Jul. 8, 1981, Ser. No. 281,259
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D34—17

271,718
MOBILE TRASH BAG HOLDER
Joseph A. Johno, Jr., and Sandra S. Johno, both of 8714 Link Ave., St. Louis, Mo. 63121
Filed Jan. 26, 1981, Ser. No. 228,249
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—24

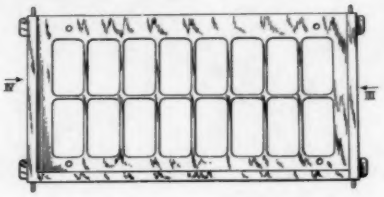
271,719
CART
W. Lynn Streiff, 3230 Inspiration Dr., Colorado Springs, Colo. 80917
Division of Ser. No. 22,713, Mar. 22, 1979, Pat. No. Des. 263,691. This application Dec. 3, 1981, Ser. No. 327,268
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—26



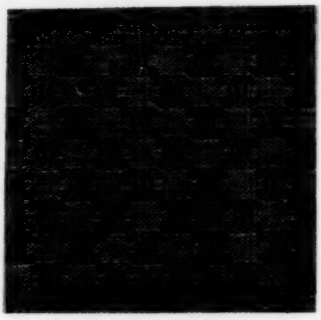
271,720
LIFT TRUCK BODY
Warner K. Brown, Battle Creek, Mich., and Dennis M. Lanci, Renton, Wash., assignors to Clark Equipment Company, Buchanan, Mich.
Filed Jul. 30, 1981, Ser. No. 288,625
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—37



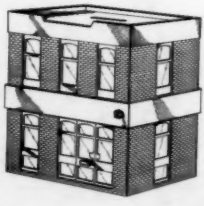
271,721
STORAGE BIN
Robert T. Howitt, Leominster, Mass., assignor to Frem Corporation, Worcester, Mass.
Filed Oct. 19, 1981, Ser. No. 312,742
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D34—40



271,722
TEXTILE FABRIC
Richard Vipiana, Paris, France, assignor to Celine S.A., Paris, France
Filed Jun. 25, 1981, Ser. No. 277,402
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D92—1 P



271,723
MONEY BOX
Matthew Lutos, London, England, assignor to Barclays Bank PLC, London, England
Filed Jun. 15, 1982, Ser. No. 388,600
Claims priority, application United Kingdom, Dec. 24, 1981, 1004365
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—41



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF DECEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aarding Weerstandslas B.V.: *See*—
Loggers, Hendrik; and Versteeg, Gijsbert, 4,419,312., Cl. 264-82.000.

Abbott Laboratories: *See*—
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,419,461., Cl. 521-126.000.

Abe, Ryuzo: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,419,710., Cl. 360-133.000.

Abrams, John C., to Potters Industries, Inc. Conductive paste, electroconductive body and fabrication of same. 4,419,279., Cl. 252-514.000.

Achtenberg, Theo: *See*—
Sattlegger, Hans; Schnurrbusch, Karl; and Achtenberg, Theo, 4,419,484., Cl. 524-731.000.

Ackermann, Jurgen; Moretto, Hans-Heinrich; Kniege, Wilfried; and Rauer, Werner, to Bayer Aktiengesellschaft. Flame-repellent polysiloxane molding compositions. 4,419,474., Cl. 524-195.000.

Adams, Bertram C.: *See*—
Adams, Kenneth E.; and Adams, Bertram C., 4,418,936., Cl. 280-493.000.

Adams, Kenneth E.; and Adams, Bertram C. Tow bar head for aircraft. 4,418,936., Cl. 280-493.000.

Adelman, Roger A. Signal processing apparatus. 4,419,544., Cl. 179-107.0FD.

Advanced Mechanical Technology, Inc.: *See*—
Schuetz, Mark A., 4,419,074., Cl. 431-354.000.

Aeroquip Corporation: *See*—
Nelson, Roger, 4,418,450., Cl. 24-265.0CD.

Agatahama, Shunichi, to Omron Tateisi Electronics Co. Unitary contact-terminal blades integrally formed in a molded base. 4,419,640., Cl. 335-106.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Nittel, Fritz; and Mader, Helmut, 4,419,441., Cl. 430-377.000.

Agnese, Gino: *See*—
Ghelli, Giovanni; Bruschi, Enrico; and Agnese, Gino, 4,419,515., Cl. 346-5.000.

Agnew, Ralph E., to McCulloch Corporation. Method and apparatus for attenuating sound. 4,418,790., Cl. 181-268.000.

Aidlin, Samuel S.; and Aidlin, Stephen H. Device and method for feeding hot articles to prevent mutual adherence thereof. 4,418,482., Cl. 34-20.000.

Aidlin, Stephen H.: *See*—
Aidlin, Samuel S.; and Aidlin, Stephen H., 4,418,482., Cl. 34-20.000.

Ainslie, Norman G.; Krzanowski, James E.; and Palmateer, Paul H., to International Business Machines Corp. High melting point process for Au:Sn:80:20 brazing alloy for chip carriers. 4,418,857., Cl. 228-124.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Fujimori, Fumio, 4,418,797., Cl. 188-73.370.
Katagiri, Masayoshi; Nomura, Yoshihisa; Kawaguchi, Hiroshi; Nishina, Shuho; and Miura, Eiji, 4,418,964., Cl. 303-6.00C.
Yamamoto, Junji; and Harada, Shingo, 4,418,956., Cl. 296-216.000.

Akihiro, Hirai: *See*—
Reiji, Oguma; and Akihiro, Hirai, 4,419,118., Cl. 65-18.200.

Akiyama, Toshimitsu; and Kasamatsu, Tadashi, to K-Three Products Kabushiki Kaisha. Method of producing corrugated cardboards and apparatus. 4,419,173., Cl. 156-470.000.

Aktiebolaget Bofors: *See*—
Boberg, Tore, 4,419,153., Cl. 149-22.000.

Aktiebolaget Draco: *See*—
Olsson, O. A. Torsten; Svensson, Leif A.; and Wetterlin, Kjell I. L., 4,419,364., Cl. 424-300.000.

Aktiengesellschaft Adolph Saurer: *See*—
Lucian, Anton, 4,418,728., Cl. 139-452.000.

Akzona Incorporated: *See*—
Clemence, Dudley A.; and Das, Pankaj K., 4,419,322., Cl. 264-343.000.
Richmond, James M.; Reck, Richard A.; and Bernard, Gary A., 4,419,140., Cl. 106-273.00N.

Albany International Corp.: *See*—
Bolton, Joseph A.; and Dufresne, Louis L., 4,419,249., Cl. 210-783.000.
Josef, Michael J.; and Lanthier, Joseph D., 4,418,726., Cl. 139-383.00A.

Alberta Energy Company Ltd.: *See*—
Jagodzinski, Richard F.; and Kerr, Richard K., 4,419,337., Cl. 423-574.00R.

Alexander, Brian S., to Hollister Incorporated. Ostomy appliance and faceplate attachment therefor. 4,419,100., Cl. 604-339.000.

Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., to Colgate-Palmolive Company. Agglomerated bentonite particles for incorporation in heavy duty particulate laundry softening detergent compositions. 4,419,250., Cl. 252-8.600.

Allen, John D., Jr.: *See*—
McCulla, William H.; and Allen, John D., Jr., 4,418,989., Cl. 350-486.000.

Allen Organ Company: *See*—
Whitefield, John T., 4,418,601., Cl. 84-1.260.

Allen, Susan M.: *See*—
Barry, Brian; Sadler, John H. R.; Allen, Susan M.; and Artt, David W., 4,419,044., Cl. 415-117.000.

Allis-Chalmers Corporation: *See*—
O'Connor, John W., 4,418,935., Cl. 280-461.00A.

Allmer, Franz, to Canron Corporation. Bidirectionally operative tie exchanging apparatus. 4,418,625., Cl. 104-9.000.

Allred, David D.: *See*—
Czubatyj, Wolodymyr; Singh, Rajendra; Doehler, Joachim; Allred, David D.; and Reyes, Jaime M., 4,419,533., Cl. 136-259.000.

Alpert, Nathaniel M.: *See*—
Strauss, H. William; Moore, Richard H.; and Alpert, Nathaniel M., 4,419,585., Cl. 250-505.100.

Altman, Vladimir. Stopping fixture. 4,418,592., Cl. 82-34.00C.

Alumax, Inc.: *See*—
Arnold, J. Edgar, 4,418,435., Cl. 15-4.000.

Alwani, Dru: *See*—
Nelsen, Suzanne; Ozari, Yehuda; Alwani, Dru; and Wotier, Edward, 4,419,471., Cl. 524-100.000.

Alwani, Dru W.: *See*—
Hort, Eugene V.; Anderson, Lowell R.; and Alwani, Dru W., 4,419,266., Cl. 252-392.000.

ALZA Corporation: *See*—
Leeper, Harold M.; Baumrind, Nikki; and Peery, John R., 4,419,096., Cl. 604-132.000.

AM General Corporation: *See*—
Goodell, Fred L.; and Ellison, Michael J., 4,418,737., Cl. 152-416.000.

Amca International Corporation: *See*—
Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., 4,418,561., Cl. 72-406.000.

Amchem Products, Inc.: *See*—
Murakami, Ryoichi; Shimizu, Hideo; Yoshii, Takashi; Ishida, Minoru; and Yonekura, Hiroto, 4,419,147., Cl. 148-31.500.

American Can Company: *See*—
Eckstein, John P., 4,418,841., Cl. 222-107.000.
Oppermann, Walter J., 4,419,373., Cl. 426-234.000.

American Carbons, Inc.: *See*—
Bowen, Mack D.; and Purdy, Kenneth R., 4,419,185., Cl. 201-4.000.

American Cyanamid Company: *See*—
Chang, Eugene Y. C.; and Behrens, Rudolf A., 4,419,493., Cl. 525-76.000.
Child, Ralph G.; and Lang, Stanley A., Jr., 4,419,354., Cl. 424-248.560.
Feldman, Allan M.; and Forgione, Peter S., 4,419,294., Cl. 260-453.00A.
Pong, Richard G. S.; Nasdagiri, Arun; Bilynskyj, Olch M.; and Hunter, Le Roy, 4,418,846., Cl. 222-189.000.
Zoltan, Bart J., 4,419,016., Cl. 368-10.000.

American Hoechst Corporation: *See*—
Neumann, Don B.; Norton, Lyle K.; and Olson, Eric V., 4,419,675., Cl. 346-108.000.

American Home Products Corporation: *See*—
Wei, Peter H. L.; and Bell, Stanley C., 4,419,516., Cl. 546-119.000.

American Hospital Supply Corporation: *See*—
Deaton, David W., 4,419,093., Cl. 604-49.000.

American Newspaper Publishers Association: *See*—
Moynihan, John T., 4,419,132., Cl. 106-27.000.

American Sawmill Machinery Company: *See*—
Dwyer, Liam D., 4,419,534., Cl. 174-10.000.

American Standard Inc.: *See*—
Hart, James E.; Spalding, Willard P.; and Kyllonen, Allen W., 4,418,799., Cl. 188-153.00R.

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Bradley, Leonard R.; Schmitt, Wayne I.; and Macedo, Antone F., Jr., 4,418,804., Cl. 190-18.00A.

Ammon, J. Preston; Weaver, Harry R.; and Norman, Richard O., to Elfab Corporation. Method of manufacturing a printed circuit card edge connector having a pull through bellows contact a lay-over insulator. 4,418,475., Cl. 29-842.000.

AMP Incorporated: *See*—
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,418,983., Cl. 350-96.210.
Brown, Christopher K.; and Wion, Donald A., 4,418,453., Cl. 29-33.00M.

MacDougall, Alan R., 4,418,974., Cl. 339-75.00M.
Ampex Corporation: *See—*
Morrison, Eric F., 4,419,686., Cl. 358-13.000.
Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V.: *See—*
Wolters, Tjako A.; Goedegebuure, Gerard W. H.; de Witt, Bartholomeus M.; and Veltman, Constantius H. M., 4,418,484., Cl. 37-63.000.
Ancona, Frank A. Fish bait protector. 4,418,490., Cl. 43-25.200.
Anderson, Ardis L.: *See—*
Boyer, Lyndon D.; Anderson, Ardis L.; and Britton, Michael W., 4,418,752., Cl. 166-267.000.
Anderson-Cook, Inc.: *See—*
Killop, James T., 4,418,454., Cl. 29-90.00B.
Anderson, Gary W.; and Stake, Dennis G., to Electronic Equipment Development Ltd. Nonmagnetic lead handling system. 4,418,815., Cl. 198-476.000.
Anderson, Lowell R.: *See—*
Hort, Eugene V.; Anderson, Lowell R.; and Alwani, Dru W., 4,419,266., Cl. 252-392.000.
Anderson, Scott. Method for producing large diameter high purity sodium amalgam particles. 4,419,303., Cl. 264-9.000.
Anderson, Vincent P., to Whirlpool Corporation. Nonsymmetric bore contour for rotary compressor. 4,419,059., Cl. 418-150.000.
Andre, Pierre A.; Thevenin, Jean-Claude P. H. P.; Girault, Jean-Pierre Y. B.; and Richter, Gerhard, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Method and device for reducing the noise of turbo-machines. 4,419,045., Cl. 415-119.000.
Angelini, Sergio, to Brevetti Elettrogalvanici Superfiniture S.R.L. Method and apparatus for continuously chromium-plating. 4,419,194., Cl. 204-25.000.
Angevine, Philip J.; Kuhl, Gunter H.; and Mizrahi, Sadi, to Mobil Oil Corporation. Catalytic conversion of shale oil. 4,419,218., Cl. 208-59.000.
Anglo-American Clays Corporation: *See—*
Cook, Jerry A.; and Cobb, Gary L., 4,419,228., Cl. 209-9.000.
Ani-live Film Service, Inc.: *See—*
Cooper, Sidney; and Jacob, Ezekiel J., 4,419,430., Cl. 430-109.000.
Ankeny, V. Scott, to Tafco Equipment Company. Vehicle spare tire carrier. 4,418,851., Cl. 224-42.060.
Ansite, William K.; Van Haastert, J. A.; and Cleary, James D., to Figgie International Inc. Gas filter container. 4,419,110., Cl. 55-356.000.
Aoki, Hiroyuki: *See—*
Oshima, Masaharu; Ikezawa, Kenji; and Aoki, Hiroyuki, 4,419,213., Cl. 204-425.000.
Apblett, William R., Jr.; and Rehn, Irwin M., to Electric Power Research Institute, Inc. Spall-resistant steel tubing or other steel articles subjected to high temperature steam and method. 4,419,144., Cl. 148-6.200.
Apcom, Inc.: *See—*
Murphy, Robert A.; and Fehrmann, George L., 4,419,567., Cl. 219-336.000.
Applegate, Edward R. Vehicle fuel cap locking device. 4,418,553., Cl. 70-164.000.
Appliance Design Probe Inc.: *See—*
McGaw, John, 4,419,565., Cl. 219-222.000.
Applied Materials, Inc.: *See—*
Kirshman, Samson, 4,419,076., Cl. 432-253.000.
Appropriate Technology Corporation: *See—*
Woolnough, James; Gardner, Bruce; and May, David A., 4,418,739., Cl. 160-120.000.
Arai, Ryuji: *See—*
Chiba, Yoshiharu; Umezawa, Hidetsugu; Sakabe, Takao; and Arai, Ryuji, 4,418,729., Cl. 139-452.000.
Arai, Yoshihiro; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Magnetic recording media and process of producing them. 4,419,404., Cl. 428-336.000.
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., to Abbott Laboratories. Catalyst for making polyurethanes. 4,419,461., Cl. 521-126.000.
Ardac, Inc.: *See—*
Gorgone, Robert L.; and Dolejs, Anthony H., 4,418,824., Cl. 209-534.000.
Arendt, Henry P.: *See—*
Yonker, John H.; and Arendt, Henry P., 4,418,756., Cl. 166-383.000.
Arieh, Simon; Courvoisier, Guy; and Prost, Jean-Louis, to Battelle Memorial Institute. Process for measuring and analyzing potentials of piezo-electric origin generated by a rigid member made of an organic material. 4,418,577., Cl. 73-772.000.
Arlt, Dieter; and Klein, Gerhard, to Bayer Aktiengesellschaft. Preparation of nitriles from formamides. 4,419,297., Cl. 260-465.200.
Armstrong World Industries, Inc.: *See—*
Hager, Nathaniel E., Jr., 4,419,023., Cl. 374-179.000.
Kane, John F.; and Weinhold, Kerry L., 4,419,384., Cl. 427-57.000.
Arnold, J. Edgar, to Alumax, Inc. Carbon butt cleaning apparatus and method. 4,418,435., Cl. 15-4.000.
Arntyr, Oscar S.; and Engstrom, Thord I. Filtering and collecting device for water drains. 4,419,232., Cl. 210-164.000.
Arrigoni Computer Graphics: *See—*
Arrigoni, David M., 4,419,539., Cl. 178-18.000.
Arrigoni, David M., to Arrigoni Computer Graphics. Apparatus for preventing noise generation in an electrical digitizer due to generation of optical signals. 4,419,539., Cl. 178-18.000.
Arthur, Ronald H., to Illinois Tool Works Inc. Rotary switch. 4,419,546., Cl. 200-11.00G.
Artt, David W.: *See—*
Barry, Brian; Sadler, John H. R.; Allen, Susan M.; and Artt, David W., 4,419,044., Cl. 415-117.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Fujiwara, Takashi; Kajita, Shuji; Matsushita, Tetsuo; and Manabe, Seiichi, 4,419,317., Cl. 264-184.000.
Ishijima, Shizuo; Kiritani, Takeshi; and Hayashi, Yukio, 4,419,134., Cl. 106-87.000.
ASEA Aktiebolag: *See—*
Bergdahl, Bernt, 4,419,660., Cl. 340-653.000.
Ashby, Bruce A.; and Schroeter, Siegfried H., to General Electric Company. Ultraviolet light absorbing agents and compositions and articles containing same. 4,419,405., Cl. 428-412.000.
Asher, Sidney. Orthodontic face-bow and method of preventing injuries with the use of face-bows. 4,419,077., Cl. 433-5.000.
Ashihara, Yoshihiro: *See—*
Kasahara, Yasushi; Ashihara, Yoshihiro; Sugiyama, Masami; and Harada, Takahiro, 4,419,445., Cl. 435-20.000.
Ashland Oil, Inc.: *See—*
Myers, George D.; and Busch, Lloyd E., 4,419,223., Cl. 208-120.000.
Asmundsson, Einar; Hart, Robert P.; and Fleischer, Donald W., to Veeder Industries, Inc. Liquid level measuring system. 4,418,571., Cl. 73-304.00C.
Asselin, George F., to UOP Inc. Recovery of aromatic hydrocarbons and a non-aromatic raffinate stream from a hydrocarbon charge stock. 4,419,226., Cl. 208-325.000.
Astle, William H., to Tri Tool Inc. Pipe end preparation and cutoff tool. 4,418,591., Cl. 82-4.00C.
Ataka, Saburo: *See—*
Ishioka, Sachio; Imamura, Yoshinori; Shimomoto, Yasuharu; Ataka, Saburo; Tanaka, Yasuo; and Maruyama, Eiichi, 4,419,604., Cl. 313-385.000.
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., to University of Manchester Institute of Science and Technology, The; and Simon-Hartley Limited. Growth of biomass. 4,419,243., Cl. 210-618.000.
Atkinson, Ivor B.; and Holdstock, Barry C. Preparation of cross-linked hydrogel copolymers for contact lenses. 4,419,463., Cl. 523-106.000.
Atlantic Richfield Company: *See—*
Emery, Leonard W., 4,418,751., Cl. 166-261.000.
Miller, Richard F., 4,419,106., Cl. 44-62.000.
Siegfried, Robert W., II, 4,419,748., Cl. 367-31.000.
Atlas Aluminium-Fahrzeugtechnik GmbH: *See—*
Brandner, Burkhard; Knufelmann, Manfred; and Blauhut, Reinhold, 4,418,668., Cl. 123-416.000.
Atom S.p.A.: *See—*
Cantella, Emiliano, 4,418,595., Cl. 83-55.000.
Atsumi, Tomiaki; Kuse, Kazumasa; and Deto, Junji, to Toyota Jidosha Kabushiki Kaisha. Cushioned mounting device with a mass member forming a sub-oscillation system and means for restricting cushioning movement. 4,418,898., Cl. 267-63.00R.
Audeh, Costandi A., to Mobil Oil Corporation. Process for improving the yield of shale oil. 4,419,217., Cl. 208-11.00R.
Audeh, Costandi A., to Mobil Oil Corporation. Method for the disposal of shot coke. 4,419,456., Cl. 518-703.000.
August Hohnholz KG: *See—*
Melchior, Bernd, 4,419,459., Cl. 521-59.000.
August Thiele: *See—*
Clement, Anton, 4,418,526., Cl. 59-85.000.
Augustyn, Michael D.: *See—*
Horton, Tommy A.; and Augustyn, Michael D., 4,419,230., Cl. 210-114.000.
Auracher, Franz: *See—*
Keil, Rudolf; Auracher, Franz; and Stockmann, Michael, 4,418,980., Cl. 350-96.130.
Automotive Products Limited: *See—*
Windsor, Harry M., 4,418,810., Cl. 192-0.076.
Avions Marcel Dassault-Breguet Aviation: *See—*
Georges, Jean-Francois M.; and Parus, Roger, 4,419,079., Cl. 434-43.000.
Ayliffe, Peter J.: *See—*
Crossland, William A.; Coates, David; and Ayliffe, Peter J., 4,419,664., Cl. 340-784.000.
Azeau, Jean J. E.: *See—*
Coffy, Rene L.; and Azeau, Jean J. E., 4,419,398., Cl. 428-174.000.
B. C. Research Council: *See—*
Yamamoto, Masanobu, 4,419,370., Cl. 426-7.000.
B. F. Goodrich Company, The: *See—*
Rowe, Eugene H., 4,419,487., Cl. 525-38.000.
Sehm, Eugene J., 4,419,502., Cl. 526-209.000.
Baba, Takashi: *See—*
Yagi, Hiroyuki; and Baba, Takashi, 4,419,770., Cl. 455-301.000.
Babcock & Wilcox Company, The: *See—*
Conde, James C.; and Larsen, Paul S., 4,418,742., Cl. 165-8.000.
Long, William G.; and Moeller, Helen H., 4,419,454., Cl. 501-95.000.
Russell, Thomas D., 4,418,541., Cl. 60-667.000.
Walton, Lewis A., 4,418,462., Cl. 29-426.400.
Backhouse, Alan J.; Bromley, Charles; and Thompson, Morice W., to Imperial Chemical Industries PLC. Polymerization process. 4,419,465., Cl. 523-201.000.
Backlund, Ake, to Kamyr AB. Method for control of chemicals during gas treatment of suspensions. 4,419,184., Cl. 162-49.000.
Baermann, Horst, to Max Baermann GmbH. Switchable permanent magnetic holding device. 4,419,644., Cl. 335-288.000.

Baglai, Vitaly M.: *See*—
Bondarenko, Oleg P.; Genis, Igor A.; Baglai, Vitaly M.; Fedorovsky, Boris B.; Medovar, Boris I.; Timashov, Grigory A.; Us, Vasily I.; Pavlichenko, Georgy S.; and Sidorenko, Igor G., 4,418,741., Cl. 164-454.000.

Buhl, Surinder K.; Howell, Margene C.; and Pace, Loy D., to Mead Corporation. Wire wound flat-faced charge plate. 4,419,674., Cl. 346-75.000.

Bahr, Dietrich J.; and Briska, Marian, to International Business Machines Corporation. Process for producing compact lacquer layers for record carriers. 4,419,392., Cl. 427-404.000.

Baker, Edward A. Shelf-type storage system. 4,418,627., Cl. 108-91.000.

Baker, Marvin E. Chlorinator for a swimming pool. 4,419,233., Cl. 210-169.000.

Baker Mine Services, Inc.: *See*—
Nelson, Robert C., 4,418,872., Cl. 241-187.000.

Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., to Kozponti Banyaszati Fejlesztesi Intezet; Magyar Aluminiumipari Troszt; and Skotchinsky Institut Gornogo Dela. Pressure limiting valve, particularly for hydraulic mine props. 4,418,715., Cl. 137-508.000.

Balint, Valer; Pinter, Andras; and Mika, Gyorgy, to Orszagos Koolaj es Gazipari Troszt; and Budapesti Muszaki Egyetem. Process for the recovery of shale oil, heavy oil, kerogen or tar from their natural sources. 4,419,214., Cl. 208-8.00R.

Balkan, Thelma E. Method and apparatus for coloring Easter eggs. 4,419,103., Cl. 8-506.000.

Ball Corporation: *See*—
Gross, Robert M., 4,419,412., Cl. 428-542.800.
Reynolds, Virgil C., Jr.; and Cerny, Daryl D., 4,419,319., Cl. 264-292.000.

Ballast-Nedam Groep N.V.: *See*—
Wolters, Tjako A.; Goedegebuure, Gerard W. H.; de Witt, Bartholomeus M.; and Veltman, Constantius H. M., 4,418,484., Cl. 37-63.000.

Balmforth, Willard R.; Weber, David C.; and Gibbons, Michael L., to Bendix Autolite Corp. Temperature sensor. 4,419,652., Cl. 338-28.000.

Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., to Eli Lilly and Company. Fermentation process for producing demycinosyltylosin. 4,419,447., Cl. 435-76.000.

Baltz, Richard H.; Kirst, Herbert A.; Wild, Gene M.; and Seno, Eugene T., to Eli Lilly and Company. 20-Dihydro-20-deoxy-23-demycinosyltylosin and process for its production. 4,419,508., Cl. 536-7.100.

Bangs, Leigh B.: *See*—
Dorman, Linneaus C.; and Bangs, Leigh B., 4,419,453., Cl. 436-534.000.

Bankert, Ralph A., to Hercules Incorporated. Process for producing quaternary ammonium amino polyamide containing halohydrin functionality. 4,419,498., Cl. 525-426.000.

Bankert, Ralph A., to Hercules Incorporated. Process for producing quaternary ammonium polyamino areylene containing halohydrin functionality. 4,419,500., Cl. 525-540.000.

Bantam Systems, Inc.: *See*—
Simmons, Robert A., 4,418,558., Cl. 72-177.000.

Barakitis, Nikolaos; and Cohen, Sheppard, to GTE Products Corporation. Discharge lamp starter and starting and operating circuitry. 4,419,607., Cl. 315-73.000.

Baranowski, James A.: *See*—
Jindrick, James A.; Hurley, James R.; Gilker, Clyde; Nohria, Naresh K.; Baranowski, James A.; and Dolnik, Thomas G., 4,419,619., Cl. 323-257.000.

Barker, William C.: *See*—
Slager, Donald M.; and Barker, William C., 4,419,669., Cl. 343-18.00D.

Barnett, William P. Precision resistor fabrication employing tapped resistive elements. 4,418,474., Cl. 29-612.000.

Baron, Walter J.; and Cleaver, Laird C., to Water Services of America, Inc. Shuttle cleaning of heat exchanger tubes. 4,418,747., Cl. 165-95.000.

Barrett, James H.; Howell, Thomas J.; and Lein, George M., *Jr.*, to Rohm and Haas Company. Copolymer process and product therefrom consisting of crosslinked seed bead swollen by styrene monomer. 4,419,245., Cl. 210-681.000.

Barry, Brian; Sadler, John H. R.; Allen, Susan M.; and Artt, David W., to Rolls-Royce Limited. Gas turbine engine. 4,419,044., Cl. 415-117.000.

Barto, Robert M., Jr.; and Lopata, Ira, to Ragen Precision Industries, Inc. Feed hopper assembly for particulate material and printer. 4,418,643., Cl. 118-657.000.

BASF Aktiengesellschaft: *See*—
Brandstetter, Franz; Echte, Adolf; Naarmann, Herbert; and Priebe, Edmund, 4,419,478., Cl. 524-318.000.
Dehnert, Johannes; and Loeffler, Hermann, 4,419,290., Cl. 260-186.000.
Graser, Fritz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,419,427., Cl. 430-58.000.
Kilpper, Gerhard; and Grimmer, Johannes, 4,419,519., Cl. 548-480.000.

Baskins, Lew E.; and Ellis, J. Patrick, to Chevron Research Company. Power-up rack and method of use in association with portable microcomputers within a refinery and the like. 4,419,616., Cl. 320-2.000.

Batori, Sandor: *See*—
Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lajza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, 4,419,355., Cl. 424-249.000.

Battarel, Claude, to Crouzet. Shift register for magnetic domain propagation memory. 4,419,742., Cl. 365-87.000.

Battelle Development Corporation: *See*—
Sliemers, Francis A.; and McGinniss, Vincent D., 4,419,382., Cl. 427-40.000.

Battelle Memorial Institute: *See*—
Arieh, Simon; Courvoisier, Guy; and Prost, Jean-Louis, 4,418,577., Cl. 73-772.000.

Bauck, Randall C.: *See*—
Radman, Anton J.; Bauck, Randall C.; and Kleczkowski, Peter S., 4,419,704., Cl. 360-102.000.

Bauer, Claude J.: *See*—
Leep, Oral F.; Dellinger, Vernon D.; and Bauer, Claude J., 4,419,537., Cl. 174-65.00R.

Bauer, Karl-Heinz; Eckert, Gerold; and Labude, Wolfgang, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co. Key assembly. 4,419,639., Cl. 334-7.000.

Bauer, Peter. Toy puzzle arrangement. 4,418,914., Cl. 273-153.00S.

Baumbach, Wolfgang: *See*—
Kuhnert, Lothar; Costiselia, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, 4,419,440., Cl. 430-377.000.

Baumberger, Otto: *See*—
Kalbskopf, Reinhard; and Baumberger, Otto, 4,419,570., Cl. 219-522.000.

Baumrind, Nikki: *See*—
Leeper, Harold M.; Baumrind, Nikki; and Peery, John R., 4,419,096., Cl. 604-132.000.

Bautex Adolf Stover KG: *See*—
Spohr, Horst, 4,418,461., Cl. 29-407.000.

Baxter, Barry J., to Commonwealth of Australia. Synchronizing circuit. 4,418,999., Cl. 354-132.000.

Baxter Travenol Laboratories, Inc.: *See*—
Becker, Lawrence F.; and Cobean, Richard W., 4,419,169., Cl. 156-359.000.
St. John, Peter A., 4,418,565., Cl. 73-19.000.
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Bayer Aktiengesellschaft: *See*—
Ackermann, Jurgen; Moretto, Hans-Heinrich; Kniege, Wilfried; and Rauer, Werner, 4,419,474., Cl. 524-195.000.
Arlt, Dieter; and Klein, Gerhard, 4,419,297., Cl. 260-465.200.
Breidenbach, Peter; Bock, Manfred; Pedain, Josef; and Mennicken, Gerhard, 4,419,513., Cl. 544-222.000.
Henning, Hans-Joachim; Lahrs, Jurgen; and Liebach, Dietrich, 4,419,295., Cl. 260-453.0PH.
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, ans, 4,419,361., Cl. 424-273.00R.
Muschelknautz, Edgar; and Rink, Norbert, 4,419,117., Cl. 65-16.000.
Raue, Roderich, 4,419,511., Cl. 542-471.000.
Reetz, Manfred T.; and Chatziiosifidis, Ioannis, 4,419,296., Cl. 260-464.000.
Rottmaier, Ludwig; and Merten, Ruldolf, 4,419,520., Cl. 548-264.000.
Sattlegger, Hans; Schnurrbusch, Karl; and Achtenberg, Theo, 4,419,484., Cl. 524-731.000.

Bayer, Ernst; and Schumann, Wilhelm, to Heyl & Co. Chemisch-Pharmazeutische Fabrik. Polymeric hydrogenation catalysts, the production thereof and their use to promote hydrogenation. 4,419,490., Cl. 525-61.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Gaede, Georg, 4,418,659., Cl. 123-90.460.
Henning, Richard, 4,418,655., Cl. 123-41.82R.

Baylor College of Medicine: *See*—
Nichols, Buford L., *Jr.*; Klish, William J.; and Potts, Vivian E., 4,419,369., Cl. 426-2.000.

Beal, George W., to United States of America, Air Force. Flameholder stabilization plate for an aircraft engine afterburner system. 4,418,531., Cl. 60-261.000.

Beard, Walter C. Tip sealing tilt valve structure for viscous flow liquids. 4,418,847., Cl. 222-402.250.

Beavers, Baxter: *See*—
McFarland, William W.; and Beavers, Baxter, 4,418,861., Cl. 229-23.00A.

Beck, James E.; and Patel, Arvind M., to Sun Electric Corporation. Gas analyzing techniques. 4,418,566., Cl. 73-23.000.

Beckenbach, Helmuth: *See*—
Beckenbach, Ulrich; and Beckenbach, Helmuth, 4,419,036., Cl. 414-160.000.

Beckenbach, Ulrich; and Beckenbach, Helmuth. Apparatus for charging a shaft furnace. 4,419,036., Cl. 414-160.000.

Becker, Lawrence F.; and Cobean, Richard W., to Baxter Travenol Laboratories, Inc. Apparatus for radiant heat sealing of balloon onto catheter shaft. 4,419,169., Cl. 156-359.000.

Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, to Siemens Aktiengesellschaft. Monitoring system for the capacitor batteries of a three-phase filter circuit. 4,419,621., Cl. 324-51.000.

Becker, Werner; Kistner, Heinz; and Schrotz, Kurt, to Eiselte Pendaflex Corporation. Portable labeling machine. 4,419,171., Cl. 156-384.000.

Beckerick, Philippe J.; Hamelin, Patrice R.; and Fumez, Andre R. Production of molded products based upon a two-component hydraulic mineral resin. 4,419,196., Cl. 204-157.10R.

Beckman Instruments, Inc.: *See*—
Penhasi, Harry A., 4,418,950., Cl. 292-144.000.

Becton Dickinson and Company: *See*—
Bennett, Michael C., 4,419,098., Cl. 604-263.000.
Garner, Richard L.; and Winans, Luther, Jr., 4,419,451., Cl. 435-298.000.
Hoch, Louis; and Lutkowski, Lawrence, 4,418,703., Cl. 128-766.000.

Becwar, Andrew J.: *See*—
Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J., 4,418,527., Cl. 60-39.050.

Behl, Robert S.; and Ellis, Franklin H., to Sybron Corporation. Metalized medical treatment electrode with insulated edge. 4,419,091., Cl. 604-20.000.

Behrens, Rudolf A.: *See*—
Chang, Eugene Y. C.; and Behrens, Rudolf A., 4,419,493., Cl. 525-76.000.

Beijbom, Peter: *See*—
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,418,801., Cl. 188-202.000.

Bejot, Emile; and Filiaggi, Adriano, to La Telemecanique Electrique. Determining asynchronous motor couple. 4,419,625., Cl. 324-142.000.

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Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,418,749., Cl. 165-139.000.

Bell & Howell Company: *See*—
Roldan, Bayani E., 4,418,874., Cl. 242-.3G..

Bell, Richard L.: *See*—
Helms, Charles R.; and Bell, Richard L., 4,418,834., Cl. 220-359.000.

Bell, Stanley C.: *See*—
Wei, Peter H. L.; and Bell, Stanley C., 4,419,516., Cl. 546-119.000.

Bell Telephone Laboratories, Incorporated: *See*—
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., 4,419,756., Cl. 375-7.000.
De Gennaro, Cosmo H.; and Hooper, Neil, 4,419,757., Cl. 375-17.000.
Embree, Milton L.; Knollman, Dieter J. H.; and Martin, Earl O., 4,419,542., Cl. 179-77.000.
Jin, Sungho, 4,419,148., Cl. 148-120.000.
Johnson, David W., Jr.; MacChesney, John B.; and Rabinovich, Eliezer M., 4,419,115., Cl. 65-3.120.
Ketchledge, Raymond W., 4,419,623., Cl. 324-57.00Q.
Larson, Allen L., 4,419,728., Cl. 364-200.000.
Le Craw, Roy C.; Luther, Lars C.; and Nelson, Terence J., 4,419,417., Cl. 428-692.000.
Levinstein, Hyman J.; and Vratny, Frederick, 4,419,201., Cl. 204-192.00E.
Liss, Warren A., 4,418,971., Cl. 339-17.00L.
Morris, James E., 4,419,632., Cl. 330-277.000.
Noerpel, Anthony R., 4,419,671., Cl. 343-786.000.
Wilson, Thomas G., Jr., 4,419,723., Cl. 363-21.000.

Bellar, Dennis; and Sasser, Thurman, to Laser Photonics, Inc. Color beam projector apparatus. 4,418,996., Cl. 353-33.000.

Bellmann, Walter, to Daimler-Benz Aktiengesellschaft. Modular pump-nozzle unit for an internal combustion engine. 4,418,664., Cl. 123-273.000.

Belter, Jerome G., to Dana Corporation. Fluid seal for engine crankshaft applications. 4,418,920., Cl. 277-50.000.

Benasutti, John E., to Burroughs Corporation. Electrical connector for printed wiring board. 4,418,972., Cl. 339-14.00R.

Bendix Autolite Corp.: *See*—
Balmforth, Willard R.; Weber, David C.; and Gibbons, Michael L., 4,419,652., Cl. 338-28.000.

Bendix Corporation, The: *See*—
Johannesen, Donald D.; and Haluda, Raymond P., 4,418,798., Cl. 188-73.450.
Johnson, Edwin A.; and Leung, Chun K., 4,418,669., Cl. 123-436.000.
Kelso, Charles R.; and Walter, Richard P., 4,418,671., Cl. 123-450.000.
Krieder, Robert D., 4,419,729., Cl. 364-426.000.
Martin, Michael D., 4,418,582., Cl. 74-493.000.
Sisson, Albert E., 4,418,867., Cl. 239-88.000.
Taig, Alistair G., 4,418,583., Cl. 74-501.50R.

Bengochea, Fulgencio: *See*—
Price, Edison A.; and Bengochea, Fulgencio, 4,419,717., Cl. 362-148.000.

Bengtsson, Bengt A. Apparatus for loading objects. 4,419,039., Cl. 414-590.000.

Benitez, Francisco M.; and English, Michael F., to Exxon Research & Engineering Co. Catalytic process for the production of petroleum resins. 4,419,503., Cl. 526-237.000.

Benko, Pal: *See*—
Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, 4,419,355., Cl. 424-249.000.

Bennett, Michael C., to Becton Dickinson and Company. Needle shield. 4,419,098., Cl. 604-263.000.

Benson, Inc.: *See*—
Rutherford, Sherman L.; Bliss, Arthur E.; and Schmidt, Noel J., 4,419,679., Cl. 346-155.000.

Bentley, Arthur P. Rotary engine. 4,418,663., Cl. 123-243.000.

Benton, William M., to Vericard Corporation. Output power modulated wind responsive apparatus. 4,419,587., Cl. 290-44.000.

Benveniste, Victor M., to Eaton Semi-Conductor Implantation Corporation. Treating workpiece with beams. 4,419,584., Cl. 250-492.200.

Bergdahl, Bernt, to ASEA Aktiebolag. Electric filter equipment. 4,419,660., Cl. 340-653.000.

Bergman, Oswald: *See*—
Hay, Robert A., II; and Bergman, Oswald, 4,419,167., Cl. 156-290.000.

Berkovitz, Michael A.: *See*—
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Bernard, Gary A.: *See*—
Richmond, James M.; Reck, Richard A.; and Bernard, Gary A., 4,419,140., Cl. 106-273.00N.

Berner, Godwin; Rembold, Manfred; and Rody, Jean, to Ciba-Geigy Corporation. Piperidine compositions for light stabilization. 4,419,472., Cl. 524-102.000.

Beroff, Howard; Doddi. Namassivaya; and Jewusiak, Stephen J., to Ethicon, Inc. Non-metallic, bio-compatible hemostatic clips. 4,418,694., Cl. 128-326.000.

Bertails, Jean P.; Perrin, Cristian; and Tallaron, Louis, to Societe pour l'Etude et la Fabrication des Circuits Integres Speciaux (EFCIS). Integrated circuit amplifier functioning in class AB and incorporating CMOS (metal oxide semiconductor) technology. 4,419,631., Cl. 330-255.000.

Bertin, Jacques; Pompei, Michel; and Valjent, Jean-Pierre, to Hutchinson-Mapa. Elastic supports, notably for vehicle engine suspension. 4,418,895., Cl. 267-140.100.

Beschke, Helmut: *See*—
Wolfgang, Bergstein; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,419,272., Cl. 502-84.000.

Bettendorf Stanford Inc.: *See*—
Pei, David C. T., 4,419,374., Cl. 426-243.000.

Bettix Limited: *See*—
Jackman, Anthony D., 4,418,843., Cl. 222-158.000.

Bhasin, Madan M.; and Warner, Glenn H., to Union Carbide Corporation. Silver catalyst for the manufacture of ethylene oxide and a process for preparing the catalyst. 4,419,276., Cl. 502-347.000.

BICC Public Limited Company: *See*—
Childs, John B.; and McKenna, Owen P., 4,419,324., Cl. 419-67.000.

Biegelsen, David K.: *See*—
Sheridon, Nicholas K.; Biegelsen, David K.; and Berkovitz, Michael A., 4,419,680., Cl. 346-163.000.

Bilynskyj, Oleh M.: *See*—
Pong, Richard G. S.; Nandagiri, Arun; Bilynskyj, Oleh M.; and Hunter, Le Roy, 4,418,846., Cl. 222-189.000.

Bindon, Jeffrey P. Electrolytic halogen generators. 4,419,207., Cl. 204-237.000.

Biomass Development S.A.: *See*—
Neuman, Marcel, 4,419,066., Cl. 425-371.000.

Biotronik Mess- und Therapiegerate GmbH & Co. Ingenieurburo Berlin: *See*—
Theisen, Peter; and Riechert, Klaus-Dieter, 4,418,704., Cl. 128-785.000.

Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, to Siemens Aktiengesellschaft. Installation for the electro-deposition of metals, particularly aluminum. 4,419,204., Cl. 204-206.000.

Bjornholt, John E., to Motorola Inc. Augmented phase-locked loop for very wide range acquisition and method therefor. 4,419,760., Cl. 375-120.000.

Black & Decker Inc.: *See*—
Grossmann, Horst, 4,418,766., Cl. 173-13.000.

Black, Geoffrey M.: *See*—
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., 4,419,243., Cl. 210-618.000.

Blad, Leiv H., to Lockheed Corporation. Automated lay-up machine. 4,419,170., Cl. 156-361.000.

Blair, George R.: *See*—
Wysocki, Joseph A.; Blair, George R.; and Vince, Michael R., 4,418,984., Cl. 350-96.330.

Blakely, Donald W., deceased: *See*—
Santilli, Donald S.; and Blakely, Donald W., deceased, 4,419,273., Cl. 502-80.000.

Blauhut, Reinhold: *See*—
Brandner, Burkhard; Knufelmann, Manfred; and Blauhut, Reinhold, 4,418,668., Cl. 123-416.000.

Blechinger, Chester J., to Ford Motor Company. Low noise vortex shedding fluid flow sensor. 4,418,578., Cl. 73-861.220.

Blessum, Norman S.: *See*—
Ragle, Herbert U.; and Blessum, Norman S., 4,419,700., Cl. 360-77.000.

Blickle, Karl: *See*—
Laucks, Rudolf; and Blickle, Karl, 4,419,085., Cl. 440-93.000.

Bliss, Arthur E.: *See*—
Rutherford, Sherman L.; Bliss, Arthur E.; and Schmidt, Noel J., 4,419,679., Cl. 346-155.000.

Bloom Engineering Company, Inc.: *See*—
Ely, Robert T., 4,419,022., Cl. 374-125.000.

Blum, Arnold, to International Business Machines Corporation. Decentralized generation of synchronized clock control signals having dynamically selectable periods. 4,419,739., Cl. 364-900.000.

Blumcraft of Pittsburgh: *See*—
Horgan, William J., Jr., 4,418,949., Cl. 292-92.000.
Boberg, Tore, to Aktiebolaget Bofors. Pyrotechnical delay charge. 4,419,153., Cl. 149-22.000.
Bock, Manfred: *See*—
Breidenbach, Peter; Bock, Manfred; Pedain, Josef; and Mennicken, Gerhard, 4,419,513., Cl. 544-222.000.
Boden, Richard M., to International Flavors & Fragrances Inc. 1-Ethoxy-1-ethanol acetate and uses thereof for augmenting or enhancing aroma or taste of consumable materials. 4,419,280., Cl. 252-522.00R.
Bodrov, Igor S.; Gudz, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., to Moskovsky Institut Khimicheskogo Mashinostroenia. Sewer plant for compressor station of gas pipeline system. 4,418,530., Cl. 60-39.181.
Boeing Company, The: *See*—
DeRosa, Richard T., 4,419,051., Cl. 416-140.000.
Gilliland, Keith E.; and Morris, Richard W., 4,418,508., Cl. 52-282.000.
Lambregts, Antonius A.; and Hansen, Rolf, 4,419,732., Cl. 364-428.000.
Vanderleest, Siebold, 4,418,879., Cl. 244-53.00B.
Boer, Kornelis; and De Widt, Hugo, to U.S. Philips Corporation. Luminaire. 4,419,719., Cl. 362-218.000.
Boetto, Charles, to International Harvester Co. Agricultural folding tool bar. 4,418,763., Cl. 172-776.000.
Boginskaya, Lidia M.: *See*—
Koiesnik, Anatoly G.; Kadnikova, Galina I.; Morozova, Lilia V.; and Boginskaya, Lidia M., 4,419,341., Cl. 424-52.000.
Bohm, Georg G. A.; Veacelius, Lee E.; and Hamed, Gary R., to Firestone Tire & Rubber Company, The. Thermoplastic elastomer blends with bitumen. 4,419,469., Cl. 524-68.000.
Bohm, Leslie E.: *See*—
Jackson, W. Shaun; and Bohm, Leslie E., 4,418,850., Cl. 224-32.00A.
Bohm, Peter: *See*—
Weiler, Rolf; and Bohm, Peter, 4,418,613., Cl. 92-98.00D.
Bollinger, Helmut; Bucken, Bernd; Schulze, Dietmar; and Wilberg, Rudiger, to VEB Hochvakuum Dresden. Method for ion-aided coating on electrically insulating substrates. 4,419,380., Cl. 427-38.000.
Bolton, Joseph A.; and Dufresne, Louis L., to Albany International Corp. Method and apparatus for dewatering a slurry of fine particles. 4,419,249., Cl. 210-783.000.
Bondarenko, Oleg P.; Genis, Igor A.; Baglai, Vitaly M.; Fedorovsky, Boris B.; Medovar, Boris I.; Timashov, Grigory A.; Us, Vasily I.; Pavlichenko, Georgy S.; and Sidorenko, Igor G. Method of controlling relative movement between an ingot and a mold. 4,418,741., Cl. 164-454.000.
Boning, Bernward; Nagel, Rudolf; Honig, Gunter; Kienzke, Uwe; and Theuerkauf, Heinz, to Robert Bosch GmbH. Knock sensing apparatus with fail indicator for use in an internal combustion engine. 4,418,567., Cl. 73-35.000.
Bopst, John H., III. Adapter for automatic tape laying machine. 4,419,172., Cl. 156-461.000.
Boral (USA) Inc.: *See*—
Thompson, Roger D., 4,418,505., Cl. 52-95.000.
Borg-Warner Corporation: *See*—
Lech, Thaddeus, Jr., 4,418,812., Cl. 192-106.200.
Wentworth, Robert S., 4,418,919., Cl. 277-40.000.
Wiese, Winfred J.; and Marsi, Joseph A., 4,418,921., Cl. 277-96.100.
Borisov, Nikolai L.: *See*—
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,418,749., Cl. 165-139.000.
Borman, Willem F. H.; Kramer, Morton; and Reilly, Eugene P., to General Electric Company. Shaped articles and process for the production thereof. 4,419,485., Cl. 525-437.000.
Borsodi, Istvan: *See*—
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Borst, Gaylord M., to Outboard Marine Corporation. Power assisted steering for marine propulsion device. 4,419,084., Cl. 440-58.000.
Bosch-Siemens Hausgerate GmbH: *See*—
Waigand, Helmut, 4,419,653., Cl. 338-114.000.
Bosso, Joseph F.: *See*—
Wismer, Marco; and Bosso, Joseph F., 4,419,467., Cl. 523-414.000.
Bouldin, Clarence C., to C. C. Bouldin Inc. Rudder control gust lock. 4,418,881., Cl. 244-224.000.
Bowen, Charles G., to Transkrit Corporation. Continuous mailer assembly. 4,418,865., Cl. 229-69.000.
Bowen, Mack D.; and Purdy, Kenneth R., to American Carbons, Inc. Pyrolysis system with hot gas recirculation. 4,419,185., Cl. 201-4.000.
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., to AMP Incorporated. Optical waveguide connector. 4,418,983., Cl. 350-96.210.
Bowers, John B.; and Bowers, Rex A. Video game platform providing spatial disorientation. 4,418,911., Cl. 273-85.00G.
Bowers, Rex A.: *See*—
Bowers, John B.; and Bowers, Rex A., 4,418,911., Cl. 273-85.00G.
Bowlds, Patsy A.; Cassidy, Bruce M.; Graham, Arthur E.; Huljak, Robert J.; Stafford, Donald W.; and Tao, Deh C., to International Business Machines Corporation. Silicon dioxide intermediate layer in thermal transfer medium. 4,419,024., Cl. 400-120.000.
Boyer, Lyndon D.; Anderson, Ardis L.; and Britton, Michael W., to Conoco Inc. Thermal oil recovery with solvent recirculation. 4,418,752., Cl. 166-267.000.
Bradley, Leonard R.; Schmitt, Wayne I.; and Macedo, Antone F., Jr., to American Tourister, Inc. Reinforced soft-sided luggage having ground support wheels. 4,418,804., Cl. 190-18.00A.
Bradshaw, Franklin C.; and Connoy, Thomas P., to Kroy Inc. Laminating device for lettered tape. 4,419,175., Cl. 156-554.000.
Braley, Charles A. Overflow control system. 4,418,712., Cl. 137-312.000.
Brand, Leonard J.; and Nadelson, Jeffrey, to Sandoz, Inc. Isoxazolyl indolamines. 4,419,353., Cl. 424-248.400.
Brandes, Wilhelm: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, ant, 4,419,361., Cl. 424-273.00R.
Brandner, Burkhard; Knafelmann, Manfred; and Blauhut, Reinhold, to Atlas Aluminium-Fahrzeugtechnik GmbH. Electronic ignition pulse generator. 4,418,668., Cl. 123-416.000.
Brandstetter, Franz; Echte, Adolf; Naarmann, Herbert; and Priebe, Edmund, to BASF Aktiengesellschaft. Thermoplastic molding materials. 4,419,478., Cl. 524-318.000.
Branigin, Michael H.; Sherbert, Edward G.; and Krasucki, Joseph F., Jr., to Sperry Corporation. Main bus interface package. 4,419,724., Cl. 364-200.000.
Branston, David, to Siemens Aktiengesellschaft. Gas discharge display device. 4,419,605., Cl. 313-485.000.
Brauer, Lothar. Gas analysis sensor for measuring concentration of gas constituent. 4,419,211., Cl. 204-408.000.
Breant, Claude, to Rhone-Poulenc Industries. N,N-Diethylheptanamide fragrances. 4,419,281., Cl. 252-522.00R.
Breant, Claude, to Rhone-Poulenc Industries. N,N-Dimethyloctanamide fragrances. 4,419,282., Cl. 252-522.00R.
Breda, Ernest J.; and Keating, Kenneth B., to Monsanto Company. Purification of methioine hydroxy analogue hydrolyzate by electrodialysis. 4,419,198., Cl. 204-180.00P.
Bredeweg, Roger L.: *See*—
Sitek, George J; and Bredeweg, Roger L., 4,419,754., Cl. 373-118.000.
Breger, Joseph L. Presbyopic contact lens. 4,418,991., Cl. 351-161.000.
Breidenbach, Peter; Bock, Manfred; Pedain, Josef; and Mennicken, Gerhard, to Bayer Aktiengesellschaft. Isocyanato-isocyanurates, and process for the production thereof. 4,419,513., Cl. 544-222.000.
Brest, William E. Ladder aid device. 4,418,793., Cl. 182-129.000.
Breuer Electric Mfg. Co.: *See*—
Fischer, Ernest J., 4,418,443., Cl. 15-326.000.
Brevetti Elettrogalvanici Superfiniture S.R.L.: *See*—
Angelini, Sergio, 4,419,194., Cl. 204-25.000.
Brine, Terence J., to Roadrunner Electronic Products Limited. Threading tool. 4,418,875., Cl. 242-7.060.
Briska, Marian: *See*—
Bahr, Dietrich J.; and Briska, Marian, 4,419,392., Cl. 427-404.000.
Bristol Corporation: *See*—
Colten, Jerrold L., 4,419,569., Cl. 219-528.000.
British Petroleum Company Limited, The: *See*—
Cayless, Richard A.; and Pippard, David A., 4,419,137., Cl. 106-14.390.
Brittain, John E.: *See*—
Hersom, Albert C.; Wright, Kenneth W.; and Brittain, John E., 4,419,376., Cl. 426-402.000.
Brittelli, David R.; and Ripka, William C., to Du Pont de Nemours, E. I., and Company. 4a-Aryl-trans-decahydroisoquinolines. 4,419,517., Cl. 546-144.000.
Britton, Michael W.: *See*—
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Broadbent, Lynn C., to Broadbent, Merle Y., a part interest. Fireplace damper and air flow control. 4,418,680., Cl. 126-289.000.
Broadbent, Merle Y.: *See*—
Broadbent, Lynn C., 4,418,680., Cl. 126-289.000.
Bromley, Charles: *See*—
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Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., to Fiber Industries, Inc. Self crimping yarn and process. 4,419,313., Cl. 264-167.000.
Brookhart, Todd E.: *See*—
Dauben, William G.; and Brookhart, Todd E., 4,419,287., Cl. 260-397.100.
Brower, Ralph D.; and Losee, Paul D., to Iomega Corporation. Ferrite beveled core for magnetic head. 4,419,705., Cl. 360-103.000.
Brown, Boveri & Cie AG: *See*—
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Knodler, Reinhold, 4,419,419., Cl. 429-104.000.
Brown, Christopher K.; and Wion, Donald A., to AMP Incorporated. Heating apparatus for shrink tubing. 4,418,453., Cl. 29-33.00M.
Brown, Morton E., to Southern Gas Association. Apparatus for phase measurement. 4,419,624., Cl. 324-83.00D.
Brown, Morton E., to Southern Gas Association. Signal source for compressor analog. 4,419,735., Cl. 364-803.000.
Brown, Paul; and O'Brien, Joseph, to Metpath Inc. Method and apparatus for collecting saliva. 4,418,702., Cl. 128-760.000.
Broze, Guy J.: *See*—
Teyssie, Philippe J.; Jerome, Robert J.; and Broze, Guy J., 4,419,482., Cl. 524-560.000.

Brunswick Corporation: *See*—
Hofmann, Gloris R., 4,418,677., Cl. 123-599.000.
Bruschi, Enrico: *See*—
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Bryer, Phillip S.: *See*—
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Buchel, Karl H.: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, ans, 4,419,361., Cl. 424-273.00R.
Bucken, Bernd: *See*—
Bollinger, Helmut; Bucken, Bernd; Schulze, Dietmar; and Wilberg, Rudiger, 4,419,380., Cl. 427-38.000.
Buckley, John A. Foldable cover for a truck bed. 4,418,954., Cl. 296-100.000.
Budapesti Muszaki Egyetem: *See*—
Balint, Valer; Pinter, Andras; and Mika, Gyorgy, 4,419,214., Cl. 208-8.00R.
Buddy L Corporation: *See*—
Kennedy, Melvin R.; and Nagel, Dietmar, 4,418,495., Cl. 46-206.000.
Buffet, Jacques. Implantable cardiac stimulator having therapeutic diagnostic functions. 4,418,695., Cl. 128-419.0PG.
Bufkin, B. George: *See*—
Gooch, Jan W.; Bufkin, B. George; and Wildman, Gary C., 4,419,139., Cl. 106-252.000.
Bugaut, Andree; and Cotteret, Jean, to L'Oreal. Chlorine-substituted nitro-para-phenylenediamines, a process for their preparation and their use in dyeing keratin fibres. 4,419,101., Cl. 8-415.000.
Burk, Ronnie F., to Deere & Company. Low pressure fluid supply system. 4,419,055., Cl. 417-396.000.
Burke, John F.: *See*—
Yannas, Ioannis V.; Burke, John F.; Orgill, Dennis P.; and Skrabut, Eugene M., 4,418,691., Cl. 128-156.000.
Burkemper Methods, Inc.: *See*—
Burkemper, Werner W., 4,419,030., Cl. 405-278.000.
Burkemper, Werner W., to Burkemper Methods, Inc. Apparatus for and method of constructing a sheet piling shoring structure. 4,419,030., Cl. 405-278.000.
Burkhart, Robert W.; Cox, Allen R.; and Hartley, John D., to International Business Machines Corp. Method of making edge protected ferrite core. 4,418,473., Cl. 29-603.000.
Burlington Industries, Inc.: *See*—
Eckert, Wayne L., 4,418,789., Cl. 181-255.000.
Wang, Kenneth Y.; and McConnell, Bobby L., 4,419,160., Cl. 156-73.200.
Burn, Ian; and Neirman, Stephen M., to Sprague Electric Company. $SrTiO_3$ barrier layer capacitor. 4,419,310., Cl. 264-59.000.
Burns, Charles W., Jr., to Standard Oil Company (Indiana). Bottle saw system. 4,418,594., Cl. 83-19.000.
Burroughs Corporation: *See*—
Benasutti, John E., 4,418,972., Cl. 339-14.00R.
Ragle, Herbert U.; and Blessum, Norman S., 4,419,700., Cl. 360-77.000.
Shultz, Richard E.; and Voecks, William E., Jr., 4,418,907., Cl. 271-157.000.
Bury, George J. Light emitting diode holder. 4,419,722., Cl. 362-396.000.
Busatis-Werke GmbH u.Co K.G. Boge GmbH: *See*—
Schneider, Rudolf; and Husch, Bruno, 4,418,520., Cl. 56-297.000.
Busch, Lloyd E.: *See*—
Myers, George D.; and Busch, Lloyd E., 4,419,223., Cl. 208-120.000.
Bush, Darrell, to Core Laboratories, Inc. Method of coating core samples. 4,419,314., Cl. 264-130.000.
Buswell, Harrie R. Continuous tube refrigeration system. 4,418,546., Cl. 62-115.000.
Butler Manufacturing Company: *See*—
Sanders, William J.; Snyder, Marvin K.; and Harter, James W., 4,418,684., Cl. 126-419.000.
Butler, Neal R.; and Carson, Alan R., to Honeywell Inc. Ultra fast driver circuit. 4,419,593., Cl. 307-268.000.
Butterfield Group: *See*—
Butterfield, Ida M., 4,418,827., Cl. 215-247.000.
Butterfield, Ida M., to Butterfield Group. Tamper-alerting device for vials and syringes. 4,418,827., Cl. 215-247.000.
Byers, John E. Sharpening device for single edge type cutting blades. 4,418,588., Cl. 76-88.000.
C. C. Bouldin Inc.: *See*—
Bouldin, Clarence C., 4,418,881., Cl. 244-224.000.
Cady, William R.: *See*—
Naster, Ronald J.; Zaidel, Simon A.; Hwang, Ying-Chen; Parks, Earl L.; and Cady, William R., 4,418,470., Cl. 29-577.00C.
Cahill, Dermot J., to Chubb Security Installations Limited. Security transfer arrangements. 4,418,628., Cl. 109-19.000.
Cairns, Hugh: *See*—
Cox, David; Cairns, Hugh; Chadwick, Nigel; and Suschitzky, John L., 4,419,352., Cl. 424-248.400.
Calebs, Robert A. Puzzle of stacked segments. 4,418,915., Cl. 273-159.000.
Campbell, George W.; and Muench, Jerome T., to United States Borax & Chemical Corporation. Boric acid having improved handling properties. 4,419,387., Cl. 427-215.000.
Canada, Her Majesty the Queen in right of: *See*—
East, Philip C., 4,419,579., Cl. 250-374.000.
Canon Inc.: *See*—
Katagiri, Kazuharu; Ishikawa, Shozo; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,419,428., Cl. 430-77.000.
Canon Kabushiki Kaisha: *See*—
Kasugayama, Yukio; Terasawa, Koji; and Hattori, Yoshihumi, 4,419,677., Cl. 346-140.00R.
Kasugayama, Yukio; Terasawa, Koji; and Hattori, Yoshihumi, 4,419,678., Cl. 346-140.00R.
Kawabata, Takashi; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,419,574., Cl. 250-204.000.
Nagashima, Nao, 4,419,006., Cl. 355-14.00R.
Canron Corporation: *See*—
Allmer, Franz, 4,418,625., Cl. 104-9.000.
Cantella, Emiliano, to Atom S.p.A. Automatic hollow punch search method for die-cutting machines, particularly for footwear production. 4,418,595., Cl. 83-55.000.
Caracciolo, Vincent P., to Du Pont de Nemours, E. I., and Company. Distillation of 1,4-butanediol. 4,419,189., Cl. 203-77.000.
Carlini, Gerardo P. V. High pressure centrifugal fluid delivery machine. 4,419,046., Cl. 415-127.000.
Caron, Bernard G.: *See*—
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,418,983., Cl. 350-96.210.
Carpenter, Charles B.: *See*—
Hamilton, Norman L.; and Carpenter, Charles B., 4,418,913., Cl. 273-150.000.
Carrona, John J.: *See*—
Walker, David M.; and Carrona, John J., 4,419,580., Cl. 250-396.00R.
Carson, Alan R.: *See*—
Butler, Neal R.; and Carson, Alan R., 4,419,593., Cl. 307-268.000.
Caruso, Fred A.: *See*—
Long, Robert B.; and Caruso, Fred A., 4,419,219., Cl. 208-86.000.
Casati, Francois M.: *See*—
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,419,461., Cl. 521-126.000.
Cassidy, Bruce M.: *See*—
Bowlds, Patsy A.; Cassidy, Bruce M.; Graham, Arthur E.; Huljak, Robert J.; Stafford, Donald W.; and Tao, Deh C., 4,419,024., Cl. 400-120.000.
Castagnos, Leonce F., Jr.; and Pratt, Roy E., to Texaco Inc. Cracking with short contact time and high temperatures. 4,419,221., Cl. 208-113.000.
Catalysts & Chemicals Industries Co., Ltd.: *See*—
Yoshida, Shin-ichi; Yano, Takemitu; and Higashi, Hidehiro, 4,419,275., Cl. 502-322.000.
Caterpillar Tractor Co.: *See*—
Piper, Harlow H., 4,418,636., Cl. 116-28.00R.
Catt, John D.; and Temple, Davis L., Jr., to Mead Johnson & Company. Isethionic acid salt of 9-cyclohexyl-2-propoxy-9H-purine-6-amine and compositions containing an effective bronchodilating concentration of it. 4,419,358., Cl. 424-253.000.
Cayless, Richard A.; and Pippard, David A., to British Petroleum Company Limited, The. Corrosion inhibitors, method of producing and protective coatings containing same. 4,419,137., Cl. 106-14.390.
Cedrone, Nicholas J.; and Lee, Kenneth R., to Daymarc Corporation. Broad band contactor assembly for testing integrated circuit devices. 4,419,626., Cl. 324-158.00P.
Celanese Corporation: *See*—
Hanson, Harry T., 4,419,504., Cl. 526-262.000.
Cense, Adriaan: *See*—
Sonnenberger, Paul; Graffenberger, Wilhelm; Cense, Adriaan; and Van Westen, Petrus A. M., 4,419,752., Cl. 370-29.000.
Centre Engineering, Inc.: *See*—
Levinson, Solomon, 4,419,713., Cl. 361-321.000.
Cerny, Daryl D.: *See*—
Reynolds, Virgil C., Jr.; and Cerny, Daryl D., 4,419,319., Cl. 264-292.000.
Cerone, Daniel J. Pool ladder. 4,418,792., Cl. 182-93.000.
Chabria, Paul R., to Press-A-Lite Corporation. Pocket flashlight. 4,419,718., Cl. 362-205.000.
Chadwick, Nigel: *See*—
Cox, David; Cairns, Hugh; Chadwick, Nigel; and Suschitzky, John L., 4,419,352., Cl. 424-248.400.
Champion Spark Plug Europe S.A.: *See*—
van den Berg, Johan H., 4,418,441., Cl. 15-250.420.
Chang, Eugene Y. C.; and Behrens, Rudolf A., to American Cyanamid Company. Sulfur-vulcanizable blends of ethylene-vinyl acetate copolymer elastomers and polyacrylate elastomers. 4,419,493., Cl. 525-76.000.
Chang, Wen-Hsuan: *See*—
Piccirilli, Robert M.; Chang, Wen-Hsuan; Porter, Samuel, Jr.; O'Dwyer, James B.; and Lee, Kyu-Wang, 4,419,407., Cl. 428-423.100.
Chapman, Ronald R.: *See*—
Lew, Hyok S.; and Chapman, Ronald R., 4,418,948., Cl. 285-420.000.
Charles, Robert G.; and Gavaler, John R., to Westinghouse Electric Corp. Method for the preparation of brittle superconducting material in ultrafine particle form. 4,419,125., Cl. 75-0.50B.
Chatziiosifidis, Ioannis: *See*—
Reetz, Manfred T.; and Chatziiosifidis, Ioannis, 4,419,296., Cl. 260-464.000.

Chemap AG: *See*—
Muller, Hans; and Muller, Felix, 4,419,244., Cl. 210-629.000.
Chemische Werke Huls AG: *See*—
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,419,458., Cl. 521-56.000.
Chemplex Company: *See*—
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, 4,419,408., Cl. 428-424.400.
Chen, Hsu C. Twin gauge and twin needle sphygmomanometers. 4,418,699., Cl. 28-685.000.
Chen, Juei-Lung. Method for making hollow pendants. 4,419,193., Cl. 204-18.100.
Chen, Nai Y.: *See*—
LaPierre, Rene B.; Partridge, Randall D.; Chen, Nai Y.; and Wong, Steven S., 4,419,220., Cl. 208-111.000.
Chen, Patricia C.: *See*—
George, Benjamin T.; and Chen, Patricia C., 4,419,725., Cl. 364-200.000.
Cheng, Dah Y.; and Wiersma, Steve J., to International Power Technology, Inc. Apparatus and method for thermal membrane distillation. 4,419,187., Cl. 202-200.000.
Cheng, Dah Y.; and Wiersma, Steve J., to International Power Technology, Inc. Composite membrane for a membrane distillation system. 4,419,242., Cl. 210-500.200.
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., to Bell Telephone Laboratories, Incorporated. Voiceband data set. 4,419,756., Cl. 375-7.000.
Chevron Research Company: *See*—
Baskins, Lew E.; and Ellis, J. Patrick, 4,419,616., Cl. 320-2.000.
Santilli, Donald S.; and Blakely, Donald W., deceased, 4,419,273., Cl. 502-80.000.
Chiba, Yoshiharu; Umezawa, Hidetsugu; Sakabe, Takao; and Arai, Ryuji, to Nissan Motor Co., Ltd. Shuttleless loom weft detaining device. 4,418,729., Cl. 139-452.000.
Chicago Digital Incorporated: *See*—
Gustafson, Alexander Z., 4,419,070., Cl. 431-126.000.
Chicago Dryer Company: *See*—
Kober, Kasimir, 4,418,486., Cl. 38-58.000.
Chichester, Willard L., to Clark Equipment Company. Method and means for bleeding hydraulic brakes. 4,418,803., Cl. 188-352.000.
Child, Francis W., to Child Laboratories Inc. Implant for inhibiting mastitis in dairy cattle. 4,418,686., Cl. 128-1.00R.
Child Laboratories Inc.: *See*—
Child, Francis W., 4,418,686., Cl. 128-1.00R.
Child, Ralph G.; and Lang, Stanley A., Jr., to American Cyanamid Company. 9,10-Bis(aminoalkoxy)anthracenes. 4,419,354., Cl. 424-248.560.
Childs, John B.; and McKenna, Owen P., to BICC Public Limited Company. Method for continuous friction actuated extrusion. 4,419,324., Cl. 419-67.000.
Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt: *See*—
Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezso; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, 4,419,524., Cl. 562-506.000.
Chinoin Gyogyszer Vegyeszeti Termekek Gyara Rt.: *See*—
Elekes, Ilona; Institoris, Laszlo; Medzihradsz, Kalman; Otvos, Laszlo; Medzihradszky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522., Cl. 549-557.000.
Cholat-Namy, Jean; Huon, Simon; and Thirion, Philippe, to International Business Machines Corp. Multiport modem and the use thereof in a method and a system for testing a multilevel communication network. 4,419,751., Cl. 370-13.000.
Christensen, Gay A.; Franco, Gerard; and Wildey, Theron L., to NCR Corporation. Teleprinter terminal. 4,419,736., Cl. 364-900.000.
Christian, Donald K. Vending machine for newspaper, magazines and the like. 4,418,836., Cl. 221-37.000.
Christiansen, Thorbjorn. Automatic angling machine. 4,418,491., Cl. 43-26.100.
Christopher, Todd J.; and Dieterich, Charles B., to RCA Corporation. Digital on video recording and playback system. 4,419,699., Cl. 358-340.000.
Chubb Security Installations Limited: *See*—
Cahill, Dermot J., 4,418,628., Cl. 109-19.000.
Chulada, Edmund C.; and Nelson, David A., to Ingersoll-Rand Company. Field replaceable screw conveyor inserts. 4,419,090., Cl. 494-53.000.
Ciba-Geigy Corporation: *See*—
Berner, Godwin; Rembold, Manfred; and Rody, Jean, 4,419,472., Cl. 524-102.000.
Falk, Robert A.; Borsodi, Istvan; and Reinehr, Dieter, 4,419,298., Cl. 260-501.160.
Karrer, Friedrich, 4,419,512., Cl. 544-70.000.
McLachlan, Donald R., 4,419,365., Cl. 424-320.000.
Meyer, Willy; and Fory, Werner, 4,419,121., Cl. 71-92.000.
Strasilla, Dieter; Meindl, Hubert; Moldovanyi, Laszlo; and Fearnley, Charles, 4,419,344., Cl. 424-70.000.
Cioca, Gheorghe, to Seton Company. Elastin hydrolyzate. 4,419,288., Cl. 260-123.700.
Cities Service Company: *See*—
Mueller, Richard A., 4,418,457., Cl. 29-157.400.
Citizen Watch Co., Ltd.: *See*—
Koni, Tsuyoshi; and Urushida, Yoshihisa, 4,418,723., Cl. 138-42.000.
Kushida, Machiro; Takasugi, Tsuneji; and Irie, Kenji, 4,419,409., Cl. 428-469.000.
Nishimura, Katsuo; and Watanabe, Minoru, 4,419,019., Cl. 368-74.000.
Claar, Paul W., to Iowa State University Research Foundation, Inc. Front axle suspension system for a vehicle chassis. 4,418,932., Cl. 280-112.00R.
Clark, Chester F.: *See*—
Wagaman, Kerry L.; Clark, Chester F.; Henderson, Larry D.; and Jones, W. Steven, 4,419,155., Cl. 149-109.600.
Clark Equipment Company: *See*—
Chichester, Willard L., 4,418,803., Cl. 188-352.000.
Rittmann, Udo, 4,418,796., Cl. 188-71.500.
Clark, Gary T.: *See*—
Fleischer, Jean C.; Clark, Gary T.; and Weaver, Max A., 4,419,289., Cl. 260-158.000.
Clark, Robert W., Jr., to Saint E. Company, Inc., The. Thermally powered heat transfer systems. 4,418,547., Cl. 62-116.000.
Class Press, Inc.: *See*—
Erwin, Paul R., 4,419,080., Cl. 434-172.000.
Claussen, Nils; and Steeb, Jorg. Production of high-strength ceramic bodies of alumina and unstabilized zirconia with controlled microfissures. 4,419,311., Cl. 264-60.000.
Clay, Irene. Washing and rinsing vessel with debris catching channel. 4,418,829., Cl. 220-74.000.
Cleary, James D.: *See*—
Ansite, William K.; Van Haastert, J. A.; and Cleary, James D., 4,419,110., Cl. 55-356.000.
Cleaver, Laird C.: *See*—
Baron, Walter J.; and Cleaver, Laird C., 4,418,747., Cl. 165-95.000.
Clemence, Dudley A.; and Das, Pankaj K., to Akzona Incorporated. Method for dilating plastics using volatile swelling agents. 4,419,322., Cl. 264-343.000.
Clemenson, James T.: *See*—
Vincent, Robert R.; and Clemenson, James T., 4,418,769., Cl. 173-134.000.
Clement, Anton, to August Thiele. Chain coupling or locking link. 4,418,526., Cl. 59-85.000.
Clifton, Ronald W.: *See*—
Harman, Robert K.; Clifton, Ronald W.; and Patterson, Russell E., 4,419,659., Cl. 340-552.000.
Coal Industry (Patents) Limited: *See*—
Harrington, Peter F., 4,418,579., Cl. 73-861.230.
Coates, David: *See*—
Crossland, William A.; Coates, David; and Ayliffe, Peter J., 4,419,664., Cl. 340-784.000.
Cobb, Gary L.: *See*—
Cook, Jerry A.; and Cobb, Gary L., 4,419,228., Cl. 209-9.000.
Cobean, Richard W.: *See*—
Becker, Lawrence F.; and Cobean, Richard W., 4,419,169., Cl. 156-359.000.
Coffy, Rene L.; and Azeau, Jean J. E., to Societe Nationale Industrielle Aerospatiale. Laminated stop of curved shape, particularly for the rotors of helicopters. 4,419,398., Cl. 428-174.000.
Cohen, Daniel. Self-supporting, table-mounted, support apparatus for receptacles. 4,418,883., Cl. 248-312.100.
Cohen, Elias, to General Instrument Corporation. Digital tuning system for a varactor tuner employing feedback means for improved tuning accuracy. 4,419,769., Cl. 455-182.000.
Cohen, Sheppard: *See*—
Barakitis, Nikolaos; and Cohen, Sheppard, 4,419,607., Cl. 315-73.000.
Cohn, Arthur, to Electric Power Research Institute, Inc. Method of manufacturing a fluid cooled blade or vane. 4,418,455., Cl. 29-156.80H.
Cole, Sylvan. Mode switching mechanism for a cassette tape recorder. 4,419,706., Cl. 360-105.000.
Colgate-Palmolive Company: *See*—
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,419,250., Cl. 252-8.600.
Hayes, Harry; and Harvey, Kenneth, 4,419,342., Cl. 424-54.000.
Vesborg, Steen, 4,418,862., Cl. 229-41.00C.
Collin, Everett E., to Nordson Corporation. Apparatus and method for film packaging. 4,418,511., Cl. 53-427.000.
Colten, Jerrold L., to Bristol Corporation. Modular heating cable assembly. 4,419,569., Cl. 219-528.000.
Combustion Engineering, Inc.: *See*—
Middleton, John A.; and O'Dwyer, Thomas L., 4,418,893., Cl. 266-192.000.
Commissariat a l'Energie Atomique: *See*—
Pouderoux, Pierre; Salon, Guy; and Nguyen-Thanh, Thong, 4,418,748., Cl. 165-134.00R.
Commonwealth of Australia: *See*—
Baxter, Barry J., 4,418,999., Cl. 354-132.000.
Communications Satellite Corporation: *See*—
Poklemba, John J., 4,419,759., Cl. 375-97.000.
Compagnie Europeenne du Zirconium Cezus: *See*—
Galle, Serge; Hautdidier, Jerome; and Soulet, Christian, 4,418,556., Cl. 72-62.000.
Compagnie Generale des Etablissements Michelin: *See*—
Musy, Jacques, 4,418,735., Cl. 152-200.000.
Conde, James C.; and Larsen, Paul S., to Babcock & Wilcox Company, The. Rotor construction for rotary regenerative air heater. 4,418,742., Cl. 165-8.000.
Condon, William T., to Twin Disc, Incorporated. Trunnion seal and cross venting system for a cardan-type universal joint. 4,419,086., Cl. 464-14.000.

Cone, Donald R.: *See—*
Westerberg, Eugene R.; and Cone, Donald R., 4,419,182., Cl. 156-644.000.

Congleton, Wayne L., to Dolco Packaging Corporation. Molding apparatus having a vented female mold member for forming foamed egg cartons. 4,419,068., Cl. 425-398.000.

Connelly, Marc: *See—*
Gulla, Michael; and Connelly, Marc, 4,419,183., Cl. 156-666.000.

Connoy, Thomas P.: *See—*
Bradshaw, Franklin C.; and Connoy, Thomas P., 4,419,175., Cl. 156-554.000.

Conoco Inc.: *See—*
Boyer, Lyndon D.; Anderson, Ardis L.; and Britton, Michael W., 4,418,752., Cl. 166-267.000.
Sifferman, Thomas R., 4,418,755., Cl. 166-281.000.
Yoon, Heeyoung, 4,418,653., Cl. 123-3.000.

Conrad, Ulrich: *See—*
Niemeier, Gerd; and Conrad, Ulrich, 4,418,675., Cl. 123-501.000.

Container Corporation of America: *See—*
Helms, Charles R.; and Bell, Richard L., 4,418,834., Cl. 220-359.000.

Continental Alloys A.A.: *See—*
Tanson, Aloyse, 4,419,127., Cl. 75-10.00R.

Continental-Wirt Electronics Corporation: *See—*
O'Shea, William F., Jr., 4,418,977., Cl. 339-99.00R.

Control Data Canada, Ltd.: *See—*
Harman, Robert K.; Clifton, Ronald W.; and Patterson, Russell E., 4,419,659., Cl. 340-552.000.

Control Data Corporation: *See—*
Walker, David M.; and Carrona, John J., 4,419,580., Cl. 250-396.00R.

Cook, Jerry A.; and Cobb, Gary L., to Anglo-American Clays Corporation. Process for producing high brightness clays utilizing magnetic beneficiation and calcining. 4,419,228., Cl. 209-9.000.

Cooper Industries, Inc.: *See—*
Vincent, Robert R.; and Clemenson, James T., 4,418,769., Cl. 173-134.000.

Cooper, Sidney; and Jacob, Ezekiel J., to Ani-live Film Service, Inc. Dry transfer of electrophotographic images. 4,419,430., Cl. 430-109.000.

Copyer Co., Ltd.: *See—*
Katagiri, Kazuharu; Ishikawa, Shozo; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,419,428., Cl. 430-77.000.

Coran, Aubert Y.; Patel, Raman; and Williams, Debra, to Monsanto Company. Compositions of urethane rubber and nylon. 4,419,499., Cl. 525-424.000.

Core Laboratories, Inc.: *See—*
Bush, Darrell, 4,419,314., Cl. 264-130.000.

Cormier, Milton J., to University of Georgia Research Foundation, Inc. Use of N-(6 aminohexyl)-5-chloro-1-naphthalenesulfonamide, N-(6 aminohexyl)-5-chloro-2-naphthalenesulfonamide, or N-(6 aminohexyl)-5-bromo-2-naphthalenesulfonamide in the uterus to prevent pregnancy. 4,419,366., Cl. 424-321.000.

Cornell, William D.: *See—*
Satchell, Fred E.; Cornell, William D.; Uitz, Mark O.; and Walker, Clarence L., 4,418,580., Cl. 73-864.130.

Corning Glass Works: *See—*
Frost, Rodney I.; and Montierth, Max R., 4,419,108., Cl. 55-97.000.

Costerton, John W. F., to Her Majesty the Queen in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources. Biofilm removal. 4,419,248., Cl. 210-764.000.

Costisella, Burkhard: *See—*
Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, 4,419,440., Cl. 430-377.000.

Cotteret, Jean: *See—*
Bugaut, Andree; and Cotteret, Jean, 4,419,101., Cl. 8-415.000.

Coughlin, James E.; Sommerfeld, Eugene G.; and Strolle, Clifford H., to Du Pont de Nemours, E. I., and Company. Ternary adhesive systems. 4,419,476., Cl. 524-284.000.

Coulter Systems Corporation: *See—*
Kuehnle, Manfred R., 4,419,004., Cl. 355-3.0TR.
Kuehnle, Manfred R., 4,419,005., Cl. 355-3.0TR.

Courneya, Calice G. Apparatus for extracting potable water. 4,418,549., Cl. 62-260.000.

Courvoisier, Guy: *See—*
Arieh, Simon; Courvoisier, Guy; and Prost, Jean-Louis, 4,418,577., Cl. 73-772.000.

Cowart, Ronald G., Sr. Method and apparatus for automatically facing saw blades having varying configurations of teeth. 4,418,589., Cl. 76-112.000.

Cox, Allen R.: *See—*
Burkhart, Robert W.; Cox, Allen R.; and Hartley, John D., 4,418,473., Cl. 29-603.000.

Cox, David; Cairns, Hugh; Chadwick, Nigel; and Suschitzky, John L., to Fisons Limited. Pyranoquinolinones and analogs thereof. 4,419,352., Cl. 424-248.400.

Cox, Joseph A., to EA Industries, Incorporated. Method and apparatus for shaping the edges of green brick and separating the same. 4,419,065., Cl. 425-301.000.

Cox, Michael W. Ice skate. 4,418,928., Cl. 280-11.140.

CPC International Inc.: *See—*
Dean, Donald H.; and Dooley, Margaret M., 4,419,450., Cl. 435-253.000.

Crawford, Thomas C.; and Jasys, Vytautas J., to Pfizer Inc. Preparation of halomethyl esters (and related esters) of penicillanic acid 1,1-dioxide. 4,419,284., Cl. 260-245.20R.

Creech, David C.: *See—*
Greene, C. Lawrence; Creech, David C.; and Kelley, Donald W., 4,419,372., Cl. 426-104.000.

Crenshaw, Edward L., to Milliken Research Corporation. Methods for the production of multi-level surface patterned materials. 4,418,451., Cl. 26-2.00R.

Crone, John M., Jr., to Texaco Inc. Catalyst and method of making the same. 4,419,394., Cl. 427-434.500.

Crosfield Electronics Limited: *See—*
Hammes, Philippe, 4,419,690., Cl. 358-75.000.

Crossland, William A.; Coates, David; and Aylffe, Peter J., to International Standard Electric Corporation. Co-ordinate addressing of smectic display cells. 4,419,664., Cl. 340-784.000.

Crossley, Roger; and Dickinson, Kay H., to John Wyeth and Brother Limited. Imidazalylalkylthioimidazoles. 4,419,362., Cl. 424-273.00R.

Crouzet: *See—*
Battarel, Claude, 4,419,742., Cl. 365-87.000.

Crutchfield, Marvin M., to Monsanto Company. Dialkyl glyoxylate surfactants. 4,419,258., Cl. 252-89.100.

Cullie, Eugene C., to Teledyne Farris Engineering. Blow down ring locking device. 4,418,714., Cl. 137-478.000.

Cuneo, Andrew A., Jr.; and Loftus, James J., to United States of America, Army. EM Sensor for determining impedance of EM field. 4,419,622., Cl. 324-57.00R.

Cutler, Barry L. Rotary carpet cleaning pad. 4,418,438., Cl. 15-230.000.

Cutler, Duncan B.: *See—*
Henry, Nelson R.; Cutler, Duncan B.; and Warner, William L., 4,418,771., Cl. 177-1.000.

CXA Ltd/CXA LTEE: *See—*
Davitt, Alan L.; and Yuill, Kenneth A., 4,419,154., Cl. 149-40.000.

Czubatyj, Wolodymyr; Singh, Rajendra; Doehler, Joachim; Allred, David D.; and Reyes, Jaime M., to Energy Conversion Devices, Inc. Photovoltaic device having incident radiation directing means for total internal reflection. 4,419,533., Cl. 136-259.000.

Dahms, Wolfgang, to Schering Aktiengesellschaft. Method for galvanic deposition of copper. 4,419,192., Cl. 204-15.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Tokunaga, Mototsugu, 4,419,457., Cl. 521-65.000.

Daimler-Benz Aktiengesellschaft: *See—*
Bellmann, Walter, 4,418,664., Cl. 123-273.000.
Niemeier, Gerd; and Conrad, Ulrich, 4,418,675., Cl. 123-501.000.

Dakota Plastics Company: *See—*
Koistinen, Arnold A., 4,418,496., Cl. 47-41.120.

Dana Corporation: *See—*
Belter, Jerome G., 4,418,920., Cl. 277-50.000.

Daniels, Donald V.: *See—*
Harrison, Joel N.; Daniels, Donald V.; and Peterson, Bruce R., 4,419,701., Cl. 360-77.000.

Dantinne, Pierre G. Apparatus for continuously polishing the pressure roller of a coiling machine. 4,418,503., Cl. 51-252.000.

Darton, Richard C.: *See—*
Voetter, Heinz; Van Meurs, Hubrecht C. A.; Darton, Richard C.; and Krishna, Rajamani, 4,419,215., Cl. 208-11.00R.

Das, Pankaj K.: *See—*
Clemence, Dudley A.; and Das, Pankaj K., 4,419,322., Cl. 264-343.000.

Dasi Industries, Inc.: *See—*
Nahra, John E.; and Woods, Walter, 4,419,301., Cl. 261-118.000.

Dauben, William G.; and Brookhart, Todd E., to University of California, The Regents of the. Stereocontrolled synthesis of steroidal side chains. 4,419,287., Cl. 260-397.100.

Davenport, Lawrence J., deceased; and Davenport, Nancy, executrix, to Younger Manufacturing Company. Ophthalmic progressive power lens and method of making same. 4,418,992., Cl. 351-169.000.

Davenport, Nancy, executrix: *See—*
Davenport, Lawrence J., deceased; and Davenport, Nancy, executrix, 4,418,992., Cl. 351-169.000.

Davidson, James P.: *See—*
Rosenberg, Barnett; Van Camp, Loretta; Ficher, Robert G.; Kansy, Samir; Peresie, Henry J.; and Davidson, James P., 4,419,351., Cl. 424-245.000.

Davis, Eugene E.: *See—*
Mancini, Gerardo; Searle, Richard J.; and Davis, Eugene E., 4,418,826., Cl. 215-231.000.

Davis, James A.; and Koch, Robert C., to Firestone Tire & Rubber Company, The. Wood derived, thermoplastic ester mixtures as a substitute for petroleum-derived components in compounded rubber stocks. 4,419,470., Cl. 524-76.000.

Davis, Rhetta Q., to Dow Chemical Company, The. Epoxy resin powder coatings having low gloss. 4,419,495., Cl. 525-109.000.

Davis, Thomas: *See—*
Kukes, Simon G.; and Davis, Thomas, 4,419,225., Cl. 208-251.00R.

Davitt, Alan L.; and Yuill, Kenneth A., to CXA Ltd/CXA LTEE. Delay composition for detonators. 4,419,154., Cl. 149-40.000.

Day, Curtis H.; and Loup, Ronald L., to Double A Products Company. Solenoid operated directional valves having modular construction. 4,418,720., Cl. 137-625.650.

Day, David R.; and McElroy, Lucian G. Fluid stripping apparatus including a strap for interconnecting adjacent airbags. 4,418,442., Cl. 15-312.00A.

Day, Paul L., to Park-Ohio Industries, Inc. Method for quenching heated workpieces. 4,419,149., Cl. 148-131.000.

Daymarc Corporation: *See—*
Cedrone, Nicholas J.; and Lee, Kenneth R., 4,419,626., Cl. 324-158.00P.

De Laire, Inc.: *See—*
Santini, Thomas F., 4,419,326., Cl. 422-4.000.

de Mets N.V.: *See—*
de Mets, Albert, 4,419,062., Cl. 425-101.000.

Dean, Donald H.; and Dooley, Margaret M., to CPC International Inc. Plasmid cloning vector for *Bacillus subtilis*. 4,419,450., Cl. 435-253.000.

Deaton, David W., to American Hospital Supply Corporation. Method of receiving and disposing of fluids from the body. 4,419,093., Cl. 604-49.000.

Debarre, Francois; Fabre, Jean-Louis; Farge, Daniel; and James, Claude, to Rhone-Poulenc Industries. 2,3,6,7-Tetrahydrothiazolo[3,2-a]pyrimidine derivatives having anti-rheumatic properties and pharmaceutical compositions containing them. 4,419,356., Cl. 424-251.000.

Deere & Company: *See—*
Burk, Ronnie F., 4,419,055., Cl. 417-396.000.
Halabiya, Sabah, 4,418,923., Cl. 277-167.500.
Herren, Kenneth E., 4,418,485., Cl. 37-244.000.
Kramer, Kenneth D.; Stoss, Kenneth J.; and Sparks, Gregory E., 4,419,642., Cl. 335-227.000.

Dees, John R.: *See—*
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,419,313., Cl. 264-167.000.

De Gennaro, Cosmo H.; and Hooper, Neil, to Bell Telephone Laboratories, Incorporated. Transformerless bipolar converter. 4,419,757., Cl. 375-17.000.

De Gleria, Katalin: *See—*
Elekes, Ilona; Institoris, Laszlo; Medzihradsz, Kalman; Otvos, Laszlo; Medzihradszky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522., Cl. 549-557.000.

Degussa AG: *See—*
Wolfgang, Bergstein; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,419,272., Cl. 502-84.000.

Dehnert, Johannes; and Loeffler, Hermann, to BASF Aktiengesellschaft. Diazo dyes having a coupler component attached to a sulfaphenyl-azo-phenyl-azo-radical. 4,419,290., Cl. 260-186.000.

De Lathauwer, Rene; Van Opstal, Martin; and Dijkstra, Albert J., to Safinco. Process for the directed interesterification of a triglyceride oil or oil mixture and triglyceride oils or oil mixture thus interesterified. 4,419,291., Cl. 260-410.700.

Delet, Victoria. Support brassiere. 4,418,696., Cl. 128-476.000.

Dellinger, Vernon D.: *See—*
Leep, Oral F.; Dellinger, Vernon D.; and Bauer, Claude J., 4,419,537., Cl. 174-65.00R.

Delron Research and Development Corporation: *See—*
Loomis, Richard E., 4,419,256., Cl. 252-62.000.

De Meo, Franco: *See—*
Grilli, Walter; De Meo, Franco; and Franchini, Ivan, 4,419,152., Cl. 148-12.00F.

de Mets, Albert, to de Mets N.V. Continuous operation press. 4,419,062., Cl. 425-101.000.

Denk, Hans: *See—*
Lang, Josef; Hollaus, Reinhard; Reeh, Ulrike; Denk, Hans; and Habrich, Reiner, 4,419,531., Cl. 136-251.000.

Dennis, Thomas M.: *See—*
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., 4,419,756., Cl. 375-7.000.

DeRosa, Richard T., to Boeing Company, The. Twin tension/torsion beam rotor system. 4,419,051., Cl. 416-140.000.

DeSantis, Raymond P., to PTX-Pentronix, Inc. Lapping machine and method. 4,418,501., Cl. 51-157.000.

De Schepper, Achille; and Van Peteghem, Antoine, to Metallurgie Hoboken-Overpelt. Liquid-liquid extraction. 4,419,338., Cl. 423-658.500.

Deto, Junji: *See—*
Atsumi, Tomiaki; Kuse, Kazumasa; and Deto, Junji, 4,418,898., Cl. 267-63.00R.

Dettelbach, Alfred; and Henzler, Roland, to Reich Spezialmaschinen GmbH. Applicator for applying adhesive to a work piece. 4,418,640., Cl. 118-411.000.

Deutschmann, Herbert, to MTU Motoren-und Turbinen-Union Friedrichshafen GmbH. Reciprocating internal combustion engine with disconnectible exhaust turbochargers. 4,418,536., Cl. 60-602.000.

Devine, Thomas M., Jr., to General Electric Company. Method of making apparatus for the exchange of heat using zirconium stabilized ferritic stainless steels. 4,418,859., Cl. 228-183.000.

Devro, Inc.: *See—*
Ziolko, Francis J., 4,418,447., Cl. 17-34.000.

de Waal, J. F. Fluid flow augmentor. 4,418,880., Cl. 244-199.000.

De Widt, Hugo: *See—*
Boer, Kornelis; and De Widt, Hugo, 4,419,719., Cl. 362-218.000.

de Witt, Bartholomeus M.: *See—*
Wolters, Tjako A.; Goedegebuure, Gerard W. H.; de Witt, Bartholomeus M.; and Veltman, Constantius H. M., 4,418,484., Cl. 37-63.000.

Dholakia, Anil R.; and Ruggeri, Vincent J., to RCA Corporation. Grinding apparatus. 4,418,500., Cl. 51-125.500.

Diamond Carpet Mills, Incorporated: *See—*
Moreland, Ronald; and Hawkins, Marion L., 4,418,433., Cl. 8-149.100.

Diamond Shamrock Corporation: *See—*
Gordon, Arnold Z., 4,419,278., Cl. 252-501.100.

Diaz, Stephen H.; and Horsma, David A., to Raychem Corporation. Method of encapsulation. 4,419,156., Cl. 156-49.000.

Dickey-john Corporation: *See—*
Funk, Robert C., 4,419,654., Cl. 340-52.00R.

Dickinson, Kay H.: *See—*
Crossley, Roger; and Dickinson, Kay H., 4,419,362., Cl. 424-273.00R.

Diehl GmbH & Co.: *See—*
Willi, Rauschert; Erich, Bock; and Gerald, Rieger, 4,418,624., Cl. 102-473.000.

Diel, Paul A., to Pitney Bowes Inc. Imprinting apparatus with relocatable printing device. 4,418,619., Cl. 101-269.000.

Diery, Helmut; and Hille, Martin, to Hoechst Aktiengesellschaft. Addition products from ethylene oxide-propylene oxide block polymers and bis-glycidyl ethers, a process for their preparation and their use. 4,419,265., Cl. 252-331.000.

Dieterich, Charles B.: *See—*
Christopher, Todd J.; and Dieterich, Charles B., 4,419,699., Cl. 358-340.000.

Dietrich, William J., Sr.; and Sizelove, Cary L., to DMI, Inc. Adjustable tillage implement positioning apparatus. 4,418,761., Cl. 172-271.000.

Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; Raff, Lothar; Rieger, Franz; and Wiedenmann, Hans-Martin, to Robert Bosch GmbH. Method and apparatus to measure the operating temperature of solid electrolyte-type gas sensors. 4,419,190., Cl. 204-1.00T.

Dietz, Hermann; Holfelder, Gerhard; Muller, Klaus; and Reber, Harald, to Robert Bosch GmbH. Combination gas oxygen concentration and combustion light sensor. 4,419,212., Cl. 204-424.000.

Dietzsch, Kurt; and Knoblauch, Rainer, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. K.G. Electronic circuit for controlling a heating or air-conditioning apparatus in a motor vehicle. 4,418,743., Cl. 165-12.000.

DiGiacomo, Hector; Raos, Robert R.; and Zabko, Al L., to General Battery Corporation. Wrapping apparatus for industrial battery plates. 4,418,464., Cl. 29-564.600.

Dijkstra, Albert J.: *See—*
De Lathauwer, Rene; Van Opstal, Martin; and Dijkstra, Albert J., 4,419,291., Cl. 260-410.700.

Dikstein, Shabtay; and Segal, Mark, to Yissum Research Development Company of the Hebrew University of Jerusalem. Stimulant. 4,419,367., Cl. 424-330.000.

Dillarstone, Alan: *See—*
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,419,250., Cl. 252-8.600.

Di Loreto, Joseph, to Precision Valve Corporation. Child resistant closure. 4,418,842., Cl. 222-153.000.

DiMartino, John M., to Line Fast Corporation. Telescopable retractable stacker key locking device. 4,419,034., Cl. 410-83.000.

di Ricco, Leo: *See—*
Frew, Duncan W.; Stefanini, Zorro; Schnee, Edward A.; and di Ricco, Leo, 4,419,257., Cl. 252-62.540.

DiRoss, James. Engine valve. 4,418,658., Cl. 123-80.00D.

Dischert, Robert A.; and Oakley, Charles B., to RCA Corporation. Compatible component digital system. 4,419,687., Cl. 358-13.000.

Dittmer, William H.: *See—*
Wycoff, Keith H.; and Dittmer, William H., 4,419,765., Cl. 455-36.000.

Diversified Electronics, Inc.: *See—*
Voss, Earl W., 4,419,590., Cl. 307-41.000.

Djordjevic, Ilija, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,418,667., Cl. 123-387.000.

DMA Systems Corporation: *See—*
Gruczelak, Norman P.; and Bryer, Phillip S., 4,419,703., Cl. 360-97.000.

DMI, Inc.: *See—*
Dietrich, William J., Sr.; and Sizelove, Cary L., 4,418,761., Cl. 172-271.000.

Dobson, Robert L., to Goodyear Tire & Rubber Company, The. Safety support system. 4,418,734., Cl. 152-158.000.

Dr. -Ing. Rudolf Hell GmbH: *See—*
Kehl, Christof, 4,419,426., Cl. 430-30.000.
Sing, Gerhard; and Wellendorf, Klaus, 4,419,691., Cl. 358-75.000.

Doddi, Namassivaya: *See—*
Beroff, Howard; Doddi, Namassivaya; and Jewusiak, Stephen J., 4,418,694., Cl. 128-326.000.

Doehler, Joachim: *See—*
Czubatyj, Wolodymyr; Singh, Rajendra; Doehler, Joachim; Allred, David D.; and Reyes, Jaime M., 4,419,533., Cl. 136-259.000.

Dolco Packaging Corporation: *See—*
Congleton, Wayne L., 4,419,068., Cl. 425-398.000.

Dolejs, Anthony H.: *See—*
Gorgone, Robert L.; and Dolejs, Anthony H., 4,418,824., Cl. 209-534.000.

Dolnik, Thomas G.: *See—*
Jindrick, James A.; Hurley, James R.; Gilker, Clyde; Nohria, Naresh K.; Baranowski, James A.; and Dolnik, Thomas G., 4,419,619., Cl. 323-257.000.

Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, to Toray Industries; and Toyota Jidosha Kabushiki Kaisha. Method for making carbon/metal composite pretreating the carbon with tetraisopropyltitanate. 4,419,389., Cl. 427-294.000.

Donovan, James T.; and Webster, E. Graham, to Sperry Corporation. Transport lock actuator. 4,418,516., Cl. 56-228.000.
Donovan, James T.: *See*—
Ehrhart, Philip J.; Donovan, James T.; and Webster, E. Graham, 4,418,517., Cl. 56-228.000.
Dooley, Margaret M.: *See*—
Dean, Donald H.; and Dooley, Margaret M., 4,419,450., Cl. 435-253.000.
Dorey, Howard A., to Sangamo Weston Limited. Transmission systems for transmitting signals over power distribution networks, and transmitters for use therein. 4,419,758., Cl. 375-38.000.
Dorman, Linneaus C.; and Bangs, Leigh B., to Dow Chemical Company, The. Immunological agglutination assays with dyed or colored latex and kits. 4,419,453., Cl. 436-534.000.
Dorn, Maximilian: *See*—
Meyer, Heinz; Dorn, Maximilian; and Seidl, Hans, 4,419,197., Cl. 204-159.200.
Dorr-Oliver Incorporated: *See*—
Klinkowski, Peter R., 4,419,209., Cl. 204-296.000.
Dory, Jacques. Ultrasonic scanning probe with mechanical sector scanning means. 4,418,698., Cl. 128-660.000.
Dotta, Angelo. Sealed package for wound dressing adhesive tape. 4,418,822., Cl. 206-441.000.
Double A Products Company: *See*—
Day, Curtis H.; and Loup, Ronald L., 4,418,720., Cl. 137-625.650.
Dover Corporation: *See*—
McMath, Jack A., 4,418,730., Cl. 141-207.000.
Dow Chemical Company, The: *See*—
Davis, Rhetta Q., 4,419,495., Cl. 525-109.000.
Dorman, Linneaus C.; and Bangs, Leigh B., 4,419,453., Cl. 436-534.000.
Hay, Robert A., II; and Bergman, Oswald, 4,419,167., Cl. 156-290.000.
Hefner, Robert E., Jr., 4,419,299., Cl. 260-929.000.
Henton, David E.; and O'Brien, Teresa M., 4,419,496., Cl. 525-301.000.
McKendry, Lennon H.; Ricks, Michael J.; and Rogers, Richard B., 4,419,514., Cl. 544-334.000.
Peet, Norton P.; and Sunder, Shyam, 4,419,357., Cl. 424-251.000.
Schell, Joseph G., Jr., 4,419,269., Cl. 502-169.000.
Schwartz, James E., 4,419,481., Cl. 524-551.000.
Thomson, Timothy; and Peters, Ferman, 4,419,510., Cl. 536-84.000.
Dow Corning Corporation: *See*—
Gutek, Beth L, 4,419,402., Cl. 428-266.000.
Speier, John L.; and Liles, Donald T., 4,419,060., Cl. 425-8.000.
Downs, Edward T., Jr.; and Komorek, Julius. Air control apparatus. 4,418,719., Cl. 137-625.310.
Doyle, Richard F.; Gausman, Thomas E.; and Myers, Edward T., to North American Philips Consumer Electronics Corp. Means for affixing an electronic component on a supporting medium. 4,419,536., Cl. 174-52.00R.
Drouillard, James R.: *See*—
Wanlass, Bert R.; and Drouillard, James R., 4,418,498., Cl. 49-425.000.
Druegh, Paul; and von Winnicki, Kalixt, to Siemens Aktiengesellschaft. Oscillator whose frequency is controllable by a current variation. 4,419,634., Cl. 331-117.00R.
Dubey, Michael B.: *See*—
Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J., 4,418,527., Cl. 60-39.050.
Dubiel, Oswald; Hirtsiefer, Karl R.; Muller, Johann, deceased; and by Muller, Christine, executrix, to Paul-Heinz Wagner. Screw assembly with torque determination. 4,418,590., Cl. 81-467.000.
Dufft, Jurgen, to Lucas Industries Limited. Hydraulic pressure master cylinder. 4,418,534., Cl. 60-585.000.
Dufresne, Louis L.: *See*—
Bolton, Joseph A.; and Dufresne, Louis L., 4,419,249., Cl. 210-783.000.
Dumas, Jean A.; and Naudin, Hildebert, to Societe Anonyme Rubson S.A.F. Device for absorbing moisture in a closed space. 4,419,111., Cl. 55-388.000.
Dunbar, Glenn G. Material handler. 4,418,953., Cl. 294-67.00A.
Dunlap, James G. Scissor tail dump trailer apparatus. 4,418,959., Cl. 298-19.00V.
Du Pont de Nemours, E. I., and Company: *See*—
Brittelli, David R.; and Ripka, William C., 4,419,517., Cl. 546-144.000.
Caracciolo, Vincent P., 4,419,189., Cl. 203-77.000.
Coughlin, James E.; Sommerfeld, Eugene G.; and Strolle, Clifford H., 4,419,476., Cl. 524-284.000.
Gorondy, Emery J., 4,419,102., Cl. 8-471.000.
Jayawant, Madhusudan D., 4,419,246., Cl. 210-721.000.
Duvall, David S.: *See*—
Gupta, Dinesh K.; and Duvall, David S., 4,419,416., Cl. 428-656.000.
Dwyer, Daniel T.: *See*—
Whitney, John A.; Dwyer, Daniel T.; and Sorenson, Peter F., 4,418,774., Cl. 177-210.0FP.
Dwyer, Liam D., to American Sawmill Machinery Company. End cap for communications cables. 4,419,534., Cl. 174-10.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Osterhagen, Gerhard; and Feige, Siegfried, 4,419,158., Cl. 156-66.000.
Dzewaltowski, Victor F.: *See*—
Reda, Kazimierz J.; Dzewaltowski, Victor F.; and Gile, Richard H., 4,419,612., Cl. 318-571.000.
Dziuba, Peter: *See*—
Ehrlinger, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goeft, Manfred, 4,418,785., Cl. 180-255.000.
Dzung, John C.; Perkey, Harry J.; and Schmitz, George J., to Motorola, Inc. Moisture and dust seal arrangement for a portable radio or the like. 4,418,830., Cl. 220-81.00R.
E. R. Squibb & Sons, Inc.: *See*—
Jensen, Ole R., 4,419,174., Cl. 156-513.000.
Neirinckx, Rudi D., 4,419,339., Cl. 424-1.100.
EA Industries, Incorporated: *See*—
Cox, Joseph A., 4,419,065., Cl. 425-301.000.
East, Philip C., to Canada, Her Majesty the Queen in right of. Dead time compensation circuit. 4,419,579., Cl. 250-374.000.
Eastman Kodak Company: *See*—
Fleischer, Jean C.; Clark, Gary T.; and Weaver, Max A., 4,419,289., Cl. 260-158.000.
Howe, Dennis G., 4,419,750., Cl. 369-111.000.
Molaire, Michel F.; and Williams, John V., 4,419,434., Cl. 430-207.000.
Noonan, John M.; Ryan, Raymond W.; and Houle, James F., 4,419,437., Cl. 430-270.000.
Reczek, James A.; and Elwood, James K., 4,419,435., Cl. 430-223.000.
Sublett, Bobby J., 4,419,507., Cl. 528-302.000.
Eaton Corporation: *See*—
Johnson, Oliver W., 4,418,710., Cl. 137-117.000.
Surman, James J., 4,418,568., Cl. 73-202.000.
Zajac, John, 4,418,646., Cl. 118-733.000.
Eaton Semi-Conductor Implantation Corporation: *See*—
Benveniste, Victor M., 4,419,584., Cl. 250-492.200.
Ebara Corporation: *See*—
Ishihara, Hideo; Ohshita, Takahiro; and Saito, Harumitsu, 4,419,330., Cl. 422-143.000.
Ebauches Electroniques, S.A.: *See*—
Meyrat, Clement, 4,419,018., Cl. 368-69.000.
Ebert, Hans: *See*—
Niermann, Hermann; Reichert, Gunter; Ebert, Hans; and Neumann, Friedrich, 4,419,104., Cl. 23-293.00R.
Ebi, Yutaka; and Mizuno, Akinori, to Ricoh Company, Ltd. Ink droplet ejection system. 4,419,673., Cl. 346-75.000.
Ebihara, Tadashi, to Nippon Piston Ring Co., Ltd. Powder molding method and powder compression molded composite article having a rest-curve like boundary. 4,419,413., Cl. 428-548.000.
Echte, Adolf: *See*—
Brandstetter, Franz; Echte, Adolf; Naarmann, Herbert; and Priebe, Edmund, 4,419,478., Cl. 524-318.000.
Eckert, Gerold: *See*—
Bauer, Karl-Heinz; Eckert, Gerold; and Labude, Wolfgang, 4,419,639., Cl. 334-7.000.
Eckert, Wayne L., to Burlington Industries, Inc. Muffler for a textile interlacing jet. 4,418,789., Cl. 181-255.000.
Eckhardt, Sandor: *See*—
Elekes, Ilona; Institoris, Laszlo; Medzihradsz, Kalman; Otvos, Laszlo; Medzihradszky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522., Cl. 549-557.000.
Eckstein, John P., to American Can Company. Multiple layer flexible sheet structure. 4,418,841., Cl. 222-107.000.
Ecomard, Andre, to Institut Francais du Petrole. Device for regulating the pressure of a fluid supplied to a feeding circuit from a fluid source. 4,418,535., Cl. 60-602.000.
Edamatu, Michisuke: *See*—
Nakashima, Atushi; Edamatu, Michisuke; and Kushi, Kenji, 4,418,641., Cl. 118-429.000.
Edison Price, Incorporated: *See*—
Price, Edison A.; and Bengochea, Fulgencio, 4,419,717., Cl. 362-148.000.
Egawa, Takeshi: *See*—
Yoshida, Fumio; Miki, Yukio; and Egawa, Takeshi, 4,419,000., Cl. 354-173.100.
Egbert, Leigh B.: *See*—
Johnson, Richard C.; Seshamani, Venkatraman; and Egbert, Leigh B., 4,418,650., Cl. 122-4.00D.
Ege, Sigmund, to International Standard Electric Corporation. Back-up for high voltage cable pressurizing system. 4,419,056., Cl. 417-426.000.
Eggert, Albert; Gahleitner, Erwin; and Kwiatkowski, Joachim, to Robert Bosch GmbH. Hearing aid with audio path duct extension element, and extension element attachment. 4,418,787., Cl. 181-130.000.
Egyt Gyogyszervegyeszeti Gyar: *See*—
Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, 4,419,355., Cl. 424-249.000.
Ehco, Inc.: *See*—
Erickson, Frederick J., 4,418,678., Cl. 126-9.00R.
Ehrhart, Philip J.; Donovan, James T.; and Webster, E. Graham, to Sperry Corporation. Actuating mechanism for harvester transport lock. 4,418,517., Cl. 56-228.000.
Ehrhart, Philip J.: *See*—
Koch, Earl E.; Gamber, A. Dale; and Ehrhart, Philip J., 4,418,518., Cl. 56-228.000.
Ehrlinger, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goeft, Manfred, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Steered and driven axle-end assembly. 4,418,785., Cl. 180-255.000.

Eichler, Kenneth M.: *See*—
Trosky, William J.; Eichler, Kenneth M.; Mandel, Alan F.; and Moore, William H., 4,418,795., Cl. 187-29.00R.
Eidenschink, Rudolf; Romer, Michael; and Pohl, Ludwig, to Merck Patent Gesellschaft mit beschrankter Haftung. Fluorine-containing 4,4'-bis-(cyclohexyl)-biphenyl derivatives, and dielectrics and electro-optical display elements containing them. 4,419,264., Cl. 252-299.630.
Eidenschink, Rudolf: *See*—
Praefcke, Klaus; Schmidt, Dietmar; and Eidenschink, Rudolf, 4,419,263., Cl. 252-299.630.
Eisenberg, Abraham. Brush bristle cleaning system. 4,418,436., Cl. 15-104.00R.
Elbers, Arthur H.: *See*—
Sullivan, Floyd A.; Elbers, Arthur H.; and Trierweiler, Charles M., 4,418,938., Cl. 280-661.000.
Electric Power Research Institute, Inc.: *See*—
Apblett, William R., Jr.; and Rehn, Irwin M., 4,419,144., Cl. 148-6.200.
Cohn, Arthur, 4,418,455., Cl. 29-156.80H.
Electronic Equipment Development Ltd.: *See*—
Anderson, Gary W.; and Stake, Dennis G., 4,418,815., Cl. 198-476.000.
Electrostatic Equipment Corporation: *See*—
Gillette, Donald J.; and Hajek, Bedrich, 4,418,642., Cl. 118-624.000.
Elekes, Ilona; Institoris, Laszlo; Medzihradsz, Kalman; Otvos, Laszlo; Medzihradszky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, to Chinoin Gyogyszer Vegyeszeti Termekek Gyara Rt. Hexitols containing free carboxy groups and a process for the preparation thereof. 4,419,522., Cl. 549-557.000.
Elfab Corporation: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Norman, Richard O., 4,418,475., Cl. 29-842.000.
Eli Lilly and Company: *See*—
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,419,447., Cl. 435-76.000.
Baltz, Richard H.; Kirst, Herbert A.; Wild, Gene M.; and Seno, Eugene T., 4,419,508., Cl. 536-7.100.
Hsiung, Hansen M., 4,419,509., Cl. 536-27.000.
Elliott Brothers (London) Limited: *See*—
Stephenson, Michael D.; and Waller, Winston A., 4,419,012., Cl. 356-141.000.
Ellis, Franklin H.: *See*—
Behl, Robert S.; and Ellis, Franklin H., 4,419,091., Cl. 604-20.000.
Ellis, J. Patrick: *See*—
Baskins, Lew E.; and Ellis, J. Patrick, 4,419,616., Cl. 320-2.000.
Ellison, Michael J.: *See*—
Goodell, Fred L.; and Ellison, Michael J., 4,418,737., Cl. 152-416.000.
Ellsworth, James P.: *See*—
Walker, Eugene J.; and Ellsworth, James P., 4,419,649., Cl. 337-70.000.
Elwood, James K.: *See*—
Reczek, James A.; and Elwood, James K., 4,419,435., Cl. 430-223.000.
Ely, Robert T., to Bloom Engineering Company, Inc. Noncontact temperature sensing method and apparatus for ladle preheating. 4,419,022., Cl. 374-125.000.
Embree, Milton L.; Knollman, Dieter J. H.; and Martin, Earl O., to Bell Telephone Laboratories, Incorporated. Battery feed circuit. 4,419,542., Cl. 179-77.000.
Emerson Electric Co.: *See*—
Krusemark, Kenneth J.; and Stackhouse, James L., Jr., 4,418,597., Cl. 83-478.000.
Nichols, Jimmy B., 4,418,839., Cl. 222-14.000.
Emery, Leonard W., to Atlantic Richfield Company. In-situ combustion process. 4,418,751., Cl. 166-261.000.
Emkay Manufacturing Company: *See*—
Kaplan, Alan, 4,419,379., Cl. 427-10.000.
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, to Nissan Motor Company, Limited. Plasma ignition system using photothyristors for internal combustion engine. 4,418,660., Cl. 123-143.00B.
Energy Conversion Devices, Inc.: *See*—
Czubatyj, Wolodymyr; Singh, Rajendra; Doehler, Joachim; Allred, David D.; and Reyes, Jaime M., 4,419,533., Cl. 136-259.000.
Nath, Prem, 4,419,530., Cl. 136-251.000.
Englar, William J.: *See*—
Willard, Miles J.; and Englar, William J., 4,419,375., Cl. 426-272.000.
Engler, Walter; Erdmannsdorfer, Hans; Muller, Heinz; and Wagner, Manfred, to Filterwerk Mann & Hummel GmbH. Engine air intake filter with fumes-absorbing substance. 4,418,662., Cl. 123-198.00D.
English, Michael F.: *See*—
Benitez, Francisco M.; and English, Michael F., 4,419,503., Cl. 526-237.000.
Engstrom, Thord I.: *See*—
Arntyr, Oscar S.; and Engstrom, Thord I., 4,419,232., Cl. 210-164.000.
Enso-Gutzeit OY: *See*—
Matula, Jouni, 4,419,109., Cl. 55-192.000.
Erdmannsdorfer, Hans: *See*—
Engler, Walter; Erdmannsdorfer, Hans; Muller, Heinz; and Wagner, Manfred, 4,418,662., Cl. 123-198.00D.
Erich, Bock: *See*—
Willi, Rauschert; Erich, Bock; and Gerald, Rieger, 4,418,624., Cl. 102-473.000.
Erickson, Frederick J., to Ehco, Inc. Insulated barbeque unit. 4,418,678., Cl. 126-9.00R.
Erwin, Paul R., to Class Press, Inc. Method and apparatus for teaching grammar. 4,419,080., Cl. 434-172.000.
Esmond, William G. Pleated kidney. 4,419,237., Cl. 210-321.200.
Espenscheid, Wilton F.: *See*—
Strom, E. Thomas; and Espenscheid, Wilton F., 4,418,961., Cl. 299-5.000.
Esper, Friedrich; Frey, Thomas; Geier, Heinz; Holfelder, Gerhard; and Knoll, Gunther, to Robert Bosch GmbH. Glow plug, particularly for diesel engine. 4,418,661., Cl. 123-145.00A.
Esselte Pendaflex Corporation: *See*—
Becker, Werner; Kistner, Heinz; and Schrotz, Kurt, 4,419,171., Cl. 156-384.000.
Esselte Pendeflex Corporation: *See*—
Koch, Ulf, 4,419,571., Cl. 235-1.00C.
Etablissements Francois Salomon et Fils, S.A.: *See*—
Salomon, Georges P. J., 4,418,937., Cl. 280-613.000.
Ethicon, Inc.: *See*—
Beroff, Howard; Doddi, Namassivaya; and Jewusiak, Stephen J., 4,418,694., Cl. 128-326.000.
Etoh, Kunioemi; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, to Toyo Boseki Kabushiki Kaisha. Image forming material and method. 4,419,438., Cl. 430-275.000.
Evans, Lyon E.: *See*—
Weber, Ronald J.; and Evans, Lyon E., 4,418,506., Cl. 52-209.000.
Evans, William P.: *See*—
Leger, Violeta Z.; and Evans, William P., 4,419,422., Cl. 429-194.000.
Ex-Cell-O Corporation: *See*—
Reda, Kazimierz J.; Dzewaltowski, Victor F.; and Gile, Richard H., 4,419,612., Cl. 318-571.000.
Exxon Production Research Co.: *See*—
Warren, Hollie B., Jr.; and Pauley, Thomas A., 4,418,570., Cl. 73-304.00R.
Exxon Research & Engineering Co.: *See*—
Benitez, Francisco M.; and English, Michael F., 4,419,503., Cl. 526-237.000.
Grenoble, Dane C.; Kim, Chang J.; and Murrell, Lawrence L., 4,419,222., Cl. 208-120.000.
Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, 4,419,200., Cl. 204-186.000.
Long, Robert B.; and Caruso, Fred A., 4,419,219., Cl. 208-86.000.
Young, David A., 4,419,195., Cl. 204-78.000.
F. C. Brown Rentals, Inc.: *See*—
Moody, Albert L., 4,418,681., Cl. 126-343.50R.
Fabre, Jean-Louis: *See*—
Debarre, Francois; Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,419,356., Cl. 424-251.000.
Fairchild Camera & Instrument Corp.: *See*—
Sloane, Edwin A., 4,419,656., Cl. 340-347.0CC.
Vora, Madhukar B.; and Hingarh, Hermaj K., 4,418,468., Cl. 29-577.00C.
Fairchild Swearingen Corporation: *See*—
Swearingen, Edward J., Jr., 4,419,053., Cl. 416-234.000.
Falk, Robert A.; Borsodi, Istvan; and Reinehr, Dieter, to Ciba-Geigy Corporation. Ethanolamine salts of di-perfluoroalkyl group containing acids. 4,419,298., Cl. 260-501.160.
Falxa, Martin L.; and Himmelwright, Richard S., to Polaroid Corporation. Photosensitive silver halide emulsion. 4,419,442., Cl. 430-567.000.
Familant, Harold M.: *See*—
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,419,313., Cl. 264-167.000.
Farge, Daniel: *See*—
Debarre, Francois; Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,419,356., Cl. 424-251.000.
Farrayre, Antoine: *See*—
Nussli, Jacques; Marandas, Georges J. P.; and Farrayre, Antoine, 4,419,603., Cl. 313-346.00R.
Faucher, Joseph E.; Wright, Richard R.; Pane, Francis C., Jr.; Kwoka, David; and Striebel, Edmund E., to United Technologies Corporation. Fuel nozzle for gas turbine engine. 4,418,543., Cl. 60-742.000.
Fazekas, Carl F.: *See*—
Gottschalk, Robert E.; and Fazekas, Carl F., 4,418,994., Cl. 352-78.00R.
Fearnley, Charles: *See*—
Strasilla, Dieter; Meindl, Hubert; Moldovanyi, Laszlo; and Fearnley, Charles, 4,419,344., Cl. 424-70.000.
Feaster, Fred T. Intraocular lens. 4,418,431., Cl. 3-13.000.
Federal Screw Works: *See*—
Gagnon, Richard T., 4,419,657., Cl. 340-347.00R.
Fedorovsky, Boris B.: *See*—
Bondarenko, Oleg P.; Genin, Igor A.; Baglai, Vitaly M.; Fedorovsky, Boris B.; Medovar, Boris I.; Timashov, Grigory A.; Us, Vasily I.; Pavlichenko, Georgy S.; and Sidorenko, Igor G., 4,418,741., Cl. 164-454.000.
Fehrmann, George L.: *See*—
Murphy, Robert A.; and Fehrmann, George L., 4,419,567., Cl. 219-336.000.

Feige, Siegfried: *See—*
Osterhagen, Gerhard; and Feige, Siegfried, 4,419,158., Cl. 156-66.000.

Fekete, Gyorgy: *See—*
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.

Feldman, Allan M.; and Forgione, Peter S., to American Cyanamid Company. Carbodiimide oligomers of tertiary aliphatic isocyanates. 4,419,294., Cl. 260-453.00A.

Feldstein, Nathan. Method for rendering non-platable semiconductor substrates platable. 4,419,390., Cl. 427-304.000.

Fendt, Alfons: *See—*
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,419,621., Cl. 324-51.000.

Ferrell, Robert D. Vehicular thoroughfares for power generation. 4,418,542., Cl. 60-668.000.

Ferrentino, Antonio, to Industrie Pirelli Societa per Azioni. Process and apparatus for manufacturing telecommunication cables filled with expansible powder. 4,419,157., Cl. 156-56.000.

Fiber Industries, Inc.: *See—*
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,419,313., Cl. 264-167.000.

Ficher, Robert G.: *See—*
Rosenberg, Barnett; Van Camp, Loretta; Ficher, Robert G.; Kansy, Samir; Peresie, Henry J.; and Davidson, James P., 4,419,351., Cl. 424-245.000.

Ficke, William H.; and McIntyre, Robert N., to Western Electric Company, Inc. Method for forming seals with heat shrinkable materials. 4,419,304., Cl. 264-25.000.

Figgie International Inc.: *See—*
Ansite, William K.; Van Haastert, J. A.; and Cleary, James D., 4,419,110., Cl. 55-356.000.

Filature Saint Andre: *See—*
Lemaire, Paul, 4,418,523., Cl. 57-207.000.

Filiaggi, Adriano: *See—*
Bejot, Emile; and Filiaggi, Adriano, 4,419,625., Cl. 324-142.000.

Filterwerk Mann & Hummel GmbH: *See—*
Engler, Walter; Erdmannsdorfer, Hans; Muller, Heinz; and Wagner, Manfred, 4,418,662., Cl. 123-198.00D.

Finet, Alain; Nerone, Louis R.; and Zenisek, Michael J., to Stock Equipment Company. Conveyor calibration technique. 4,418,773., Cl. 177-16.000.

Firelite Products Inc.: *See—*
Piffath, Rodney S., 4,419,069., Cl. 431-89.000.

Firestone Tire & Rubber Company, The: *See—*
Bohm, Georg G. A.; Vescelius, Lee E.; and Hamed, Gary R., 4,419,469., Cl. 524-68.000.
Davis, James A.; and Koch, Robert C., 4,419,470., Cl. 524-76.000.

Firstov, Vladislav D.: *See—*
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715., Cl. 137-508.000.

Fischer, Ernest J., to Breuer Electric Mfg. Co. Noise suppressor for vacuum sweepers and the like. 4,418,443., Cl. 15-326.000.

Fischer, Hermann, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Offset printing machine ink distribution and drying system. 4,418,620., Cl. 101-350.000.

Fischer, Robert R.; and Urschel, Joe R., to Urschel Laboratories, Incorporated. Cylinder for use with other components in processing material. 4,419,414., Cl. 428-575.000.

Fischer, Theodore E., to Polyplex Plastics, Inc. Vinyl repair composition and method. 4,419,162., Cl. 156-94.000.

Fisher, Paul C.: *See—*
Williams, Raymond S.; and Fisher, Paul C., 4,419,464., Cl. 523-161.000.

Fisons Limited: *See—*
Cox, David; Cairns, Hugh; Chadwick, Nigel; and Suschitzky, John L., 4,419,352., Cl. 424-248.400.

Flamm, Peter M.: *See—*
Miskin, Leslie; and Flamm, Peter M., 4,419,688., Cl. 358-27.000.

Flanagan, Joseph E.: *See—*
Witucki, Edward F.; and Flanagan, Joseph E., 4,419,286., Cl. 260-349.000.

Fleischer, Donald W.: *See—*
Asmundsson, Einar; Hart, Robert P.; and Fleischer, Donald W., 4,418,571., Cl. 73-304.00C.

Fleischer, Jean C.; Clark, Gary T.; and Weaver, Max A., to Eastman Kodak Company. Isothiazole type azo dyes containing imidazo type couplers. 4,419,289., Cl. 260-158.000.

Flournoy, Norman E., to Texaco Inc. Magnetic method and apparatus for measuring wall thickness. 4,418,574., Cl. 73-601.000.

Flowers, Thomas. Boring tool. 4,419,032., Cl. 408-112.000.

FMC Corporation: *See—*
Fusy, Joel L., 4,418,718., Cl. 137-615.000.
Orlando, Franklin P.; and Mortensen, Donald G., 4,418,521., Cl. 56-330.000.
Talafuse, Larry J., 4,418,947., Cl. 285-168.000.

Fohl, Artur, to REPA Feinstanzwerk GmbH. Automatic roll-up device for safety belts. 4,418,878., Cl. 242-107.300.

Folsom, Lawrence R., to Mechanical Technology Incorporated. Free-piston stirling engine inertial cancellation system. 4,418,533., Cl. 60-520.000.

Fomichev, Mikhail M.: *See—*
Bodrov, Igor S.; Gudz, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., 4,418,530., Cl. 60-39.181.

Ford Motor Company: *See—*
Blechinger, Chester J., 4,418,578., Cl. 73-861.220.
Pierce, Stanley L., 4,418,585., Cl. 74-695.000.
Stockton, Thomas R., 4,418,777., Cl. 180-65.00E.
Tabar, Ronald J.; and Killgoar, Paul C., Jr., 4,419,480., Cl. 524-525.000.

Forgach, Lilla: *See—*
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.

Forgione, Peter S.: *See—*
Feldman, Allan M.; and Forgione, Peter S., 4,419,294., Cl. 260-453.00A.

Formax, Inc.: *See—*
Sandberg, Kenneth; and Stoub, James, 4,418,446., Cl. 17-32.000.

Fortune, William S. Hot air soldering and resoldering system. 4,419,566., Cl. 219-230.000.

Fory, Werner: *See—*
Meyer, Willy; and Fory, Werner, 4,419,121., Cl. 71-92.000.

Foster, Dean H.; Mersereau, Robert E.; and Silverman, Harold, to Pitney Bowes Inc. Inserter gauging system. 4,418,515., Cl. 53-457.000.

Foster, John S.; and Zehmer, John A. M., III, to United States of America, Navy. Munroe effect breaching device. 4,418,622., Cl. 102-307.000.

Foster Wheeler Energy Corporation: *See—*
Johnson, Richard C.; Seshamani, Venkatraman; and Egbert, Leigh B., 4,418,650., Cl. 122-4.00D.

Fox, Duke. Bicycle transmission assembly. 4,418,784., Cl. 180-221.000.

Fox Mfg. Co.: *See—*
Frydel, Edmund W., 4,418,593., Cl. 82-36.00R.

Fralish, Mark R., to J. I. Case Company. Endless chain type lawn mower. 4,418,519., Cl. 56-244.000.

Frame, James R. Electronic water treating device. 4,419,206., Cl. 204-228.000.

Franchini, Ivan: *See—*
Grilli, Walter; De Meo, Franco; and Franchini, Ivan, 4,419,152., Cl. 148-12.00F.

Franco, Gerard: *See—*
Christensen, Gay A.; Franco, Gerard; and Wildey, Theron L., 4,419,736., Cl. 364-900.000.

Frankel, Milton B.; and Witucki, Edward F., to United States of America, Air Force. Azido fluorodinitro amines. 4,419,285., Cl. 260-349.000.

Frankl, Gerald P. Apparatus for recovering and recycling animal waste. 4,419,239., Cl. 210-413.000.

Franklin Electric Co., Inc.: *See—*
Whitney, John A.; Dwyer, Daniel T.; and Sorenson, Peter F., 4,418,774., Cl. 177-210.0FP.

Franklin, Leonard N., Jr.; and Hegler, Gary G., to General Motors Corporation. Hydraulic pump rotating group axial alignment structure. 4,419,058., Cl. 418-133.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung: *See—*
Kalthoff, Jorg F.; and Winkler, Siegfried, 4,418,563., Cl. 73-12.000.

Frazier, Wallace N. Roof-mounted solar collector device. 4,418,685., Cl. 126-428.000.

Frcska, Miklos: *See—*
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715., Cl. 137-508.000.

French, James R. Pipe cleaning apparatus. 4,418,437., Cl. 15-104.090.

French, Robert C.: *See—*
Nebergall, Perry A.; and French, Robert C., 4,419,095., Cl. 604-96.000.

Freudenstein, Ferdinand: *See—*
Maki, E. Roland; and Freudenstein, Ferdinand, 4,418,586., Cl. 74-831.000.

Frew, Duncan W.; Stefanini, Zorro; Schnee, Edward A.; and di Ricco, Leo, to Memorex Corporation. Magnetic coating composition. 4,419,257., Cl. 252-62.540.

Frey, Thomas: *See—*
Esper, Friedrich; Frey, Thomas; Geier, Heinz; Holfelder, Gerhard; and Knoll, Gunther, 4,418,661., Cl. 123-145.00A.

Frey-Wigger, Paul. Device for enhancing the versatility of cranes or the like. 4,418,791., Cl. 182-2.000.

Fricker, Wolfgang-Peter; and Scholz, Manfred, to Kraftwerk Union Aktiengesellschaft; and Grunzweig & Hartmann Montage GmbH. Heat insulating casing. 4,418,724., Cl. 138-149.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Friedrich, Ronald; and Hammecke, Werner, deceased, 4,418,740., Cl. 164-287.000.

Friedl, Edward L. Ground surface drainage apparatus. 4,419,231., Cl. 210-164.000.

Friedman, Joseph: *See—*
Friefeld, Jerome M.; and Friedman, Joseph, 4,418,683., Cl. 126-400.000.

Friedrich, Heinz: *See—*
Wolfgang, Bergstein; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,419,272., Cl. 502-84.000.

Friedrich, Ronald; and Hammecke, Werner, deceased (by Hammecke, Marie Elise Gisela, heiress), to Fried. Krupp Gesellschaft mit beschrankter Haftung. Centrifugal caster. 4,418,740., Cl. 164-287.000.

Friefeld, Jerome M.; and Friedman, Joseph, to Rockwell International Corporation. Separated phase thermal storage system. 4,418,683., Cl. 126-400.000.

Frima, Heico J.; and Le Poole, Jan B., to U.S. Philips Corporation. Metal wire cathode for electron beam apparatus. 4,419,561., Cl. 219-121.0EB.

Frohbach, Louis A. Apparatus for controlling a wind propelled sailing device. 4,418,631., Cl. 114-39.000.

Frohberger, Paul-Ernst: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, ans, 4,419,361., Cl. 424-273.00R.

Frost, Rodney I.; and Montierth, Max R., to Corning Glass Works. Filter apparatus and method of filtering. 4,419,108., Cl. 55-97.000.

Frydel, Edmund W., to Fox Mfg. Co. Form tool holder. 4,418,593., Cl. 82-36.00R.

Fuchigami, Mitsuru; Ishiguro, Mamoru; and Ohye, Hideo, to Mitsubishi Paper Mills, Ltd. Color-forming sheet for no-carbon copying paper. 4,418,941., Cl. 282-27.500.

Fuji Electric Company, Ltd.: *See*—
Ohmori, Tsuguharu; and Hayashi, Shizuo, 4,419,755., Cl. 373-145.000.

Fuji Electrochemical Co., Ltd.: *See*—
Torii, Michihiro; and Kobayashi, Hiroaki, 4,418,471., Cl. 29-596.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Momose, Shinroku; and Mizunuma, Tokuichi, 4,418,532., Cl. 60-316.000.

Fuji Photo Film Co., Ltd.: *See*—
Arai, Yoshihiro; and Nahara, Akira, 4,419,404., Cl. 428-336.000.
Fujita, Susumu, 4,419,002., Cl. 354-187.000.
Hosoi, Noriyuki; Hoshi, Yoshiyuki; and Matsukawa, Hiroharu, 4,418,942., Cl. 282-27.500.
Kuwazima, Shigeru; Kato, Eiichi; and Yamada, Minoru, 4,419,439., Cl. 430-375.000.
Mifune, Hiroyuki; Fuseya, Yoshiharu; and Ikenoue, Shinpei, 4,419,443., Cl. 430-600.000.
Sugiyama, Masatoshi; Nakanishi, Ichiro; and Suzuki, Yoshiaki, 4,419,388., Cl. 427-288.000.

Fuji Xerox Co., Ltd.: *See*—
Hamano, Toshihisa; Ito, Hisao; Takenouchi, Mutsuo; Ozawa, Takashi; Fuse, Mario; and Nakamura, Takeshi, 4,419,696., Cl. 358-294.000.

Fujie, Masakatsu; Matsuno, Junichi; and Furuya, Masao, to Hitachi, Ltd. Recording sheet conveying system of pressure fixing type electrostatic printing apparatus. 4,419,003., Cl. 355-3.0FU.

Fujii, Toshihiro: *See*—
Kosaka, Shuhei; and Fujii, Toshihiro, 4,419,254., Cl. 252-37.000.

Fujimori, Fumio, to Aisin Seiki Kabushiki Kaisha. Sliding caliper disc brakes. 4,418,797., Cl. 188-73.370.

Fujimoto, Sakae, to Ricoh Company, Ltd. Sheet feeding apparatus. 4,418,904., Cl. 271-37.000.

Fujimoto, Tsutomu, to Kuboto, Ltd. Tractive force sensing system for tractor. 4,418,758., Cl. 172-7.000.

Fujisaki, Masayuki: *See*—
Ogiro, Kenji; Fujisaki, Masayuki; and Gotoh, Shinichi, 4,419,708., Cl. 360-132.000.

Fujita, Minoru; and Nishida, Shigeo, to Rinzai Co., Ltd., by said Shigeo Nishida. Method of manufacturing shoe sole material and shoes products made by the same. 4,418,483., Cl. 36-28.000.

Fujita, Susumu, to Fuji Photo Film Co., Ltd. Lens extension and retracting mechanism for use in a photographic camera of folding type. 4,419,002., Cl. 354-187.000.

Fujita, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Method of simultaneously forming buried resistors and bipolar transistors by ion implantation. 4,418,469., Cl. 29-577.00C.

Fujitsu Limited: *See*—
Kikuchi, Hideo, 4,419,596., Cl. 307-603.000.
Kojima, Takuhito; Satake, Yasuo; and Masuda, Toru, 4,419,753., Cl. 370-62.000.
Nogami, Masaharu, 4,419,179., Cl. 156-613.000.
Taguchi, Masao; and Ito, Takashi, 4,419,743., Cl. 365-149.000.
Toyoda, Kazuhiro; and Ono, Chikai, 4,419,745., Cl. 365-174.000.

Fujiwara, Takashi; Kajita, Shuji; Matsushita, Tetsuo; and Manabe, Seiichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of fibers of poly-p-phenylene-terephthalamide. 4,419,317., Cl. 264-184.000.

Fujizoki Pharmaceutical Co., Ltd.: *See*—
Kasahara, Yasushi; Ashihara, Yoshihiro; Sugiyama, Masami; and Harada, Takahiro, 4,419,445., Cl. 435-20.000.

Fukino, Masato: *See*—
Nakayama, Masafumi; Yanai, Tokiyoshi; and Fukino, Masato, 4,418,779., Cl. 180-141.000.

Fukuda, Masao, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing method and apparatus therefor. 4,418,772., Cl. 177-1.000.

Fukumoto, Chihiro; Furukawa, Tokinobu; and Oda, Chikao, to Hitachi, Ltd. Process for continuous production of high impact polystyrene. 4,419,488., Cl. 525-53.000.

Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiko, to Nissan Motor Co., Ltd. Shock absorber. 4,418,802., Cl. 188-282.000.

Fukuzawa, Akira: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; and Ozaki, Tsuyoshi, 4,419,128., Cl. 75-46.000.

Fulcomer, Emanuel J., Jr.: *See*—
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., 4,419,756., Cl. 375-7.000.

Fumez, Andre R.: *See*—
Beckerick, Philippe J.; Hamelin, Patrice R.; and Fumez, Andre R., 4,419,196., Cl. 204-157.10R.

Funk, Robert C., to Dickey-john Corporation. Tractor data center. 4,419,654., Cl. 340-52.00R.

Furukawa, Tokinobu: *See*—
Fukumoto, Chihiro; Furukawa, Tokinobu; and Oda, Chikao, 4,419,488., Cl. 525-53.000.

Furusawa, Teruo: *See*—
Ichinose, Shiro; Machida, Saneto; Murakami, Shotoku; and Furusawa, Teruo, 4,419,613., Cl. 318-632.000.

Furuya, Masao: *See*—
Fujie, Masakatsu; Matsuno, Junichi; and Furuya, Masao, 4,419,003., Cl. 355-3.0FU.

Fuse, Mario: *See*—
Hamano, Toshihisa; Ito, Hisao; Takenouchi, Mutsuo; Ozawa, Takashi; Fuse, Mario; and Nakamura, Takeshi, 4,419,696., Cl. 358-294.000.

Fuseya, Yoshiharu: *See*—
Mifune, Hiroyuki; Fuseya, Yoshiharu; and Ikenoue, Shinpei, 4,419,443., Cl. 430-600.000.

Fusy, Joel L., to FMC Corporation. Method and apparatus for controlling articulated fluid loading arms upon emergency disconnection. 4,418,718., Cl. 137-615.000.

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Seragnoli, Enzo, 4,418,705., Cl. 131-84.00R.

G. L. Rexroth GmbH: *See*—
Muncke, Ludwig; and Kaus, Wolfgang, 4,418,955., Cl. 296-190.000.

Gaede, Georg, to Bayerische Motoren Werke Aktiengesellschaft. Process for preventing the pumping of a hydraulic valve clearance compensating element in valve operating mechanisms or internal combustion engines. 4,418,659., Cl. 123-90.460.

GAF Corporation: *See*—
Hort, Eugene V.; Anderson, Lowell R.; and Alwani, Dru W., 4,419,266., Cl. 252-392.000.
Nelsen, Suzanne; Ozari, Yehuda; Alwani, Dru; and Wotier, Edward, 4,419,471., Cl. 524-100.000.

Gagnon, Richard T., to Federal Screw Works. Speech digitization system. 4,419,657., Cl. 340-347.00R.

Gahleitner, Erwin: *See*—
Eggert, Albert; Gahleitner, Erwin; and Kwiatkowski, Joachim, 4,418,787., Cl. 181-130.000.

Gal, Laszlo: *See*—
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715., Cl. 137-508.000.

Galambos, Janos: *See*—
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.

Gale, George M., to Rubber and Plastics Research Association of Great Britain. Extruder mixer. 4,419,014., Cl. 366-99.000.

Galle, Serge; Hautdidier, Jerome; and Soulet, Christian, to Compagnie Europeenne du Zirconium Cezus. Precision local expansion shaping process and apparatus for metal tubes of substantial length. 4,418,556., Cl. 72-62.000.

Gallina, Ferenc, to Van Leer Verpackungen GmbH. Single tablet dispensing box. 4,418,838., Cl. 221-246.000.

Gamber, A. Dale: *See*—
Koch, Earl E.; Gamber, A. Dale; and Ehrhart, Philip J., 4,418,518., Cl. 56-228.000.

Gambon, Thomas F. Quick acting coupler. 4,418,946., Cl. 285-73.000.

Gang-Nail Systems, Inc.: *See*—
Moyer, Anthony M.; and Kelly, Robert H., 4,418,509., Cl. 52-693.000.

Ganucheau, Charles J., Jr., to Motorola, Inc. Combined tone only and tone voice multiple alert pager. 4,419,668., Cl. 340-825.440.

Garavuso, Gerald M., to Xerox Corporation. Sheet feeding apparatus. 4,418,905., Cl. 271-98.000.

Gardner, Bruce: *See*—
Woolnough, James; Gardner, Bruce; and May, David A., 4,418,739., Cl. 160-120.000.

Gardner, David P., Sr. Automatic toothpaste dispenser. 4,418,840., Cl. 222-96.000.

Garner, H. Douglas, to United States of America, National Aeronautics and Space Administration. Magnetic heading reference. 4,418,480., Cl. 33-349.000.

Garner, Richard L.; and Winans, Luther, Jr., to Becton Dickinson and Company. Oxygen scavenging system for anaerobiosis. 4,419,451., Cl. 435-298.000.

Garrocho, Jose M. Photographic paper punch. 4,418,596., Cl. 83-98.000.

Gauchard, Fernand. Apparatus for dispersing liquids. 4,418,623., Cl. 102-369.000.

Gaughan, Edmund J.: *See*—
Pallos, Ferenc M.; and Gaughan, Edmund J., 4,419,523., Cl. 560-12.000.

Gausman, Thomas E.: *See—*
Doyle, Richard F.; Gausman, Thomas E.; and Myers, Edward T., 4,419,536., Cl. 174-52.00R.
Gavaler, John R.: *See—*
Charles, Robert G.; and Gavaler, John R., 4,419,125., Cl. 75-0.50B.
Gehring, Johann: *See—*
Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, 4,419,204., Cl. 204-206.000.
Geier, Heinz: *See—*
Esper, Friedrich; Frey, Thomas; Geier, Heinz; Holfelder, Gerhard; and Knoll, Gunther, 4,418,661., Cl. 123-145.00A.
Gellatly, John S., to Western Electric Company, Inc. Method and apparatus for welding metal parts coated with a thermoplastic. 4,419,557., Cl. 219-86.250.
Gemmell, Robert M.; and Hildebrand, David B., to Mostek Corporation. Temperature compensated reference circuit. 4,419,594., Cl. 307-297.000.
General Battery Corporation: *See—*
DiGiacomo, Hector; Raos, Robert R.; and Zabko, Al L., 4,418,464., Cl. 29-564.600.
General Electric Company: *See—*
Ashby, Bruce A.; and Schroeter, Siegfried H., 4,419,405., Cl. 428-412.000.
Borman, Willem F. H.; Kramer, Morton; and Reilly, Eugene P., 4,419,485., Cl. 525-437.000.
Devine, Thomas M., Jr., 4,418,859., Cl. 228-183.000.
Leach, John G., 4,419,651., Cl. 337-159.000.
Naster, Ronald J.; Zaidel, Simon A.; Hwang, Ying-Chen; Parks, Earl L.; and Cady, William R., 4,418,470., Cl. 29-577.00C.
Sidebottom, Donald L., 4,418,744., Cl. 165-25.000.
Smetana, Andrew; and Hanson, James M., 4,418,973., Cl. 339-31.00L.
Vostovich, Joseph E., 4,419,475., Cl. 524-264.000.
General Instrument Corporation: *See—*
Cohen, Elias, 4,419,769., Cl. 455-182.000.
General Motors Corporation: *See—*
Franklin, Leonard N., Jr.; and Hegler, Gary G., 4,419,058., Cl. 418-133.000.
Kauffman, Allen L., 4,418,587., Cl. 74-867.000.
Maki, E. Roland; and Freudenstein, Ferdinand, 4,418,586., Cl. 74-831.000.
Miller, Larry D., 4,418,939., Cl. 280-803.000.
O'Keefe, John J., II, 4,418,975., Cl. 339-91.00R.
Sigety, Stephen, Jr., 4,418,440., Cl. 15-250.210.
Smith, Richard H., 4,419,113., Cl. 55-484.000.
Sullivan, Floyd A.; Elbers, Arthur H.; and Trierweiler, Charles M., 4,418,938., Cl. 280-661.000.
Wanlass, Bert R.; and Drouillard, James R., 4,418,498., Cl. 49-425.000.
General Signal Corporation: *See—*
Liddiard, Roy, 4,419,015., Cl. 366-349.000.
General Texas Corporation: *See—*
VanNess, David; Hines, Joseph; and Wells, William E., 4,419,300., Cl. 261-106.000.
Genge, Charles A. Adjustable portable saw guide device. 4,418,902., Cl. 269-258.000.
Genis, Igor A.: *See—*
Bondarenko, Oleg P.; Genis, Igor A.; Baglai, Vitaly M.; Fedorovsky, Boris B.; Medovar, Boris I.; Timashov, Grigory A.; Us, Vasily I.; Pavlichenko, Georgy S.; and Sidorenko, Igor G., 4,418,741., Cl. 164-454.000.
Genovese, Joseph. Backpack shelter apparatus. 4,418,854., Cl. 224-154.000.
George, Benjamin T.; and Chen, Patricia C., to Sperry Corporation. Cache/disk subsystem with tagalong copy. 4,419,725., Cl. 364-200.000.
George, Kurudamannil A., to Proctor & Schwartz, Inc. Apparatus for plaiting tow onto a conveyor. 4,418,856., Cl. 226-118.000.
Georges, Jean-Francois M.; and Parus, Roger, to Avions Marcel Dassault-Breguet Aviation; and Thomson-CSF. Aircraft piloting aid system. 4,419,079., Cl. 434-43.000.
Georgetown University: *See—*
Rahman, Aquilur; and Schein, Philip S., 4,419,348., Cl. 424-180.000.
Georgia-Pacific Corporation: *See—*
Kimbrell, Melvin, Sr., deceased, 4,418,863., Cl. 229-49.000.
Gerald, Rieger: *See—*
Willi, Rauschert; Erich, Bock; and Gerald, Rieger, 4,418,624., Cl. 102-473.000.
Gerber, Heinz J., to Gerber Scientific, Inc. Eyeglasses and other lenses of variable focal length and means and method for varying such focal length. 4,418,990., Cl. 351-41.000.
Gerber Scientific, Inc.: *See—*
Gerber, Heinz J., 4,418,990., Cl. 351-41.000.
Gerber Scientific Instrument Company, The: *See—*
Hevenor, Charles M., Jr., 4,419,740., Cl. 364-900.000.
Gerboth, Patrick L.; and Jozwiak, Stanley E., Jr., to SGM Co., Inc. Low noise centrifugal blower. 4,419,049., Cl. 415-206.000.
Gerbus, Leo H. Marine float. 4,418,634., Cl. 114-263.000.
Ghandour, Edmond. Returning ball toy. 4,418,494., Cl. 46-61.000.
Ghelli, Giovanni; Bruschi, Enrico; and Agnese, Gino, to Luigi Stoppani S.p.A. Two stage process for preparing 2,6-pyridinedicarboxylic acid. 4,419,515., Cl. 546-5.000.
Gibbons, Michael L.: *See—*
Balmforth, Willard R.; Weber, David C.; and Gibbons, Michael L., 4,419,652., Cl. 338-28.000.
Gibson, Ian P., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Metal coatings. 4,419,202., Cl. 204-192.00N.
Giken Kogyo Kabushiki Kaisha: *See—*
Mizobe, Masatoshi, 4,418,764., Cl. 173-12.000.
Gilbert, Paul H., to United States of America, Navy. Phase demodulator utilizing a frequency divider, synchronous filter, and phase comparator. 4,419,630., Cl. 329-50.000.
Gile, Richard H.: *See—*
Reda, Kazimierz J.; Dzewaltowski, Victor F.; and Gile, Richard H., 4,419,612., Cl. 318-571.000.
Gilker, Clyde: *See—*
Jindrick, James A.; Hurley, James R.; Gilker, Clyde; Nohria, Naresh K.; Baranowski, James A.; and Dolnik, Thomas G., 4,419,619., Cl. 323-257.000.
Gillette, Donald J.; and Hajek, Bedrich, to Electrostatic Equipment Corporation. Build control apparatus and method. 4,418,642., Cl. 118-624.000.
Gilliland, Keith E.; and Morris, Richard W., to Boeing Company, The. Rub strip assembly having lengthwise groove for receiving snap-in member. 4,418,508., Cl. 52-282.000.
Girault, Jean-Pierre Y. B.: *See—*
Andre, Pierre A.; Thevenin, Jean-Claude P. H. P.; Girault, Jean-Pierre Y. B.; and Richter, Gerhard, 4,419,045., Cl. 415-119.000.
Glass Medic, Inc.: *See—*
Matles, William B., 4,419,305., Cl. 264-36.000.
Glover, Douglas W.: *See—*
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,418,983., Cl. 350-96.210.
Goedegebuure, Gerard W. H.: *See—*
Wolters, Tjako A.; Goedegebuure, Gerard W. H.; de Witt, Bartholomeus M.; and Veltman, Constantius H. M., 4,418,484., Cl. 37-63.000.
Goeft, Manfred: *See—*
Ehrlinger, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goeft, Manfred, 4,418,785., Cl. 180-255.000.
Goeken, John D.; and Henley, Edward J. Methods and means for providing improved air/ground radio telephone communications. 4,419,766., Cl. 455-62.000.
Goiset, Jean-Pierre, to Les Modeles Francais. Security electrical power distribution systems for light aircraft equipped for flight on instruments. 4,419,588., Cl. 307-9.000.
Gooch, Jan W.; Bufkin, B. George; and Wildman, Gary C., to University of Southern Mississippi. Process for preparing coating binders from vegetable oil material. 4,419,139., Cl. 106-252.000.
Goodall, Brian L.; and Van Der Sar, Jacob C., to Shell Oil Company. Olefin polymerization catalyst components and polymerization process. 4,419,501., Cl. 526-122.000.
Goodell, Fred L.; and Ellison, Michael J., to AM General Corporation. Automatic tire inflation system. 4,418,737., Cl. 152-416.000.
Goodway Transport, Inc.: *See—*
Shaffer, James D., 4,418,853., Cl. 224-42.410.
Goodyear Tire & Rubber Company, The: *See—*
Dobson, Robert L., 4,418,734., Cl. 152-158.000.
Perkins, William G.; and Shriver, Clem B., 4,419,320., Cl. 264-296.000.
Gorbatenko, Igor V.: *See—*
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,418,749., Cl. 165-139.000.
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., to Mitco Corporation. Branch take-off and silencer for an air distribution system. 4,418,788., Cl. 181-224.000.
Gordon, Arnold Z., to Diamond Shamrock Corporation. Photoactive semiconductor material using true solid/solid solution mixed metal oxide. 4,419,278., Cl. 252-501.100.
Gordon, Roy G. Non-iridescent glass structures. 4,419,386., Cl. 427-109.000.
Gorgone, Robert L.; and Dolejs, Anthony H., to Ardac, Inc. Dual stacker for slot acceptor. 4,418,824., Cl. 209-534.000.
Gorondy, Emery J., to Du Pont de Nemours, E. I., and Company. Process for level dyeing of textiles by heat transfer. 4,419,102., Cl. 8-471.000.
Goto, Kiyoshi: *See—*
Irokawa, Shoichi; Imai, Koji; Sakurai, Takeichi; and Goto, Kiyoshi, 4,419,591., Cl. 307-45.000.
Gotoh, Shinichi: *See—*
Ogiro, Kenji; Fujisaki, Masayuki; and Gotoh, Shinichi, 4,419,708., Cl. 360-132.000.
Gottschalk, Robert E.; and Fazekas, Carl F., to Panavision, Incorporated. Film magazine for motion picture camera. 4,418,994., Cl. 352-78.00R.
Gould Inc.: *See—*
Stowe, David W., 4,418,981., Cl. 350-96.150.
Gould Medical B.V.: *See—*
Luijpers, Johannes G. T., 4,418,701., Cl. 128-729.000.
Graafmann, Jurgen, to Wavin B.V. Device for connecting plastics tubes by heatsealing. 4,419,067., Cl. 425-392.000.
Graffenberger, Wilhelm: *See—*
Sonnenberger, Paul; Graffenberger, Wilhelm; Cense, Adriaan; and Van Westen, Petrus A. M., 4,419,752., Cl. 370-29.000.
Graham, Arthur E.: *See—*
Bowlds, Patsy A.; Cassidy, Bruce M.; Graham, Arthur E.; Huljak, Robert J.; Stafford, Donald W.; and Tao, Deh C., 4,419,024., Cl. 400-120.000.

Graham, Richard P., to Singer Company, The. Belt guard lock. 4,418,630., Cl. 112-261.000.

Graser, Fritz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, to BASF Aktiengesellschaft. Electrophotographic medium with perylene-3,4,9,10-tetracarboxylic acid N,N'-bis-(2',6'-dichlorophenyl)-diimide. 4,419,427., Cl. 430-58.000.

Grasser, Katalin: *See*—
Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, 4,419,355., Cl. 424-249.000.

Gray, Thomas J., to Olin Corporation. Raney alloy coated cathode for chlor-alkali cells. 4,419,208., Cl. 204-290.00R.

Gray, William J. Single roller skate. 4,418,929., Cl. 280-11.230.

Grayson, Roy N. Ceramic wall spacer kit. 4,418,679., Cl. 126-201.000.

Greene, C. Lawrence; Creech, David C.; and Kelley, Donald W., to Zoecon Corporation. Simulated rawhide product. 4,419,372., Cl. 426-104.000.

Gregoire, Brian R.; and Yantz, Rupert O., to Phoenix Products Company, Inc. Searchlight with modular control mechanism. 4,419,721., Cl. 362-368.000.

Grenoble, Dane C.; Kim, Chang J.; and Murrell, Lawrence L., to Exxon Research and Engineering Co. Hydrocarbon conversion processes using improved transition metal oxide catalysts. 4,419,222., Cl. 208-120.000.

Gretsch, Ralf, to Robert Bosch GmbH. On-board vehicular network method for efficient generator utilization. 4,419,618., Cl. 322-7.000.

Grilli, Walter; De Meo, Franco; and Franchini, Ivan, to Italtractor ITM S.p.A. Process for direct heat treatment of track links for tractors or tracked vehicles. 4,419,152., Cl. 148-12.00F.

Grimmer, Johannes: *See*—
Kilpper, Gerhard; and Grimmer, Johannes, 4,419,519., Cl. 548-480.000.

Grinwald, Israel M., to United States of America, Army. Spare wheel-tire carrier. 4,418,852., Cl. 224-42.230.

Grob, Ferdinand: *See*—
Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; Raff, Lothar; Rieger, Franz; and Wiedenmann, Hans-Martin, 4,419,190., Cl. 204-1.00T.

Grombone, Anthony; and Van Cleave, George W., to International Business Machines Corporation. Method for controlling the toner concentration in an electrostatic copier. 4,419,010., Cl. 355-133.000.

Grondstra, Jan W.: *See*—
Wolfson, William; Grondstra, Jan W.; and Jarva, Curt, 4,419,734., Cl. 364-567.000.

Gross, Robert M., to Ball Corporation. Plastic blank structure. 4,419,412., Cl. 428-542.800.

Grossi, Anthony V.; Hagelee, Leon A.; Hahn, Louis T.; and Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Easily emulsifiable acrylamide and rubber modified asphalts. 4,419,489., Cl. 525-54.500.

Grossmann, Horst, to Black & Decker Inc. Compact multi-speed hammer-drill. 4,418,766., Cl. 173-13.000.

Gruczelak, Norman P.; and Bryer, Phillip S., to DMA Systems Corporation. Disc cartridge loading mechanism. 4,419,703., Cl. 360-97.000.

Grunzweig & Hartmann Montage GmbH: *See*—
Fricker, Wolfgang-Peter; and Scholz, Manfred, 4,418,724., Cl. 138-149.000.

Gruttner, Andreas; Nesper, Reinhard; and von Schnering, Hans-Georg, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Crystal and germanium modification and process for its preparation. 4,419,151., Cl. 148-400.000.

GTE Automatic Electric Incorporated: *See*—
Patel, Gajendra M., 4,418,459., Cl. 29-239.000.

GTE Products Corporation: *See*—
Barakitis, Nikolaos; and Cohen, Sheppard, 4,419,607., Cl. 315-73.000.
Leep, Oral F.; Dellinger, Vernon D.; and Bauer, Claude J., 4,419,537., Cl. 174-65.00R.

Guay, Jean-Louis. Device for treating living tissue with an electric current. 4,418,692., Cl. 128-303.140.

Gudz, Anatoly G.: *See*—
Bodrov, Igor S.; Gudz, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., 4,418,530., Cl. 60-39.181.

Gulf & Western Manufacturing Co.: *See*—
Huzyak, Paul E., 4,418,559., Cl. 72-201.000.
Trudeau, William H., 4,419,027., Cl. 403-134.000.

Gulla, Michael; and Connelly, Marc, to Shipley Company Inc. Etchant. 4,419,183., Cl. 156-666.000.

Gupta, Dinesh K.; and Duvall, David S., to United Technologies Corporation. Overlay coatings for superalloys. 4,419,416., Cl. 428-656.000.

Gurr, George P.; and Nelson, Bruce J., to Sangamo Weston, Inc. System for controlling power distribution to customer loads. 4,419,665., Cl. 340-825.060.

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Gurubatham, Vincent P.; and Ruspino, James G., to Whirlpool Corporation. Dishwasher upper spray arm. 4,418,868., Cl. 239-228.000.

Gustafson, Alexander Z., to Chicago Digital Incorporated. Decorative molten wax display. 4,419,070., Cl. 431-126.000.

Gutek, Beth I., to Dow Corning Corporation. Flame retardant polyorganopolysiloxane resin compositions. 4,419,402., Cl. 428-266.000.

Guth, William R., to Siemens Gammasonics, Inc. Test pattern device for radiation detector and method of manufacture. 4,419,577., Cl. 250-252.100.

H-C Industries, Inc.: *See*—
Wilde, Sheldon L.; and McCandless, Thomas J., 4,418,828., Cl. 215-252.000.

Habrich, Reiner: *See*—
Lang, Josef; Hollaus, Reinhard; Reeh, Ulrike; Denk, Hans; and Habrich, Reiner, 4,419,531., Cl. 136-251.000.

Hack, Theodore A.: *See*—
Kennedy, Carl S.; and Hack, Theodore A., 4,419,253., Cl. 252-34.700.

Hacskaylo, Michael: *See*—
Piedmont, James R.; and Hacskaylo, Michael, 4,418,466., Cl. 29-571.000.

Hagelee, Leon A.: *See*—
Grossi, Anthony V.; Hagelee, Leon A.; Hahn, Louis T.; and Marzocchi, Alfred, 4,419,489., Cl. 525-54.500.

Hager, Nathaniel E., Jr., to Armstrong World Industries, Inc. Fast-response thermocouple probe. 4,419,023., Cl. 374-179.000.

Haginomori, Eiichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Circuit breaker. 4,419,552., Cl. 200-144.0AP.

Hahn & Clay: *See*—
Pechacek, Raymond E., 4,418,560., Cl. 72-296.000.

Hahn, Louis T.: *See*—
Grossi, Anthony V.; Hagelee, Leon A.; Hahn, Louis T.; and Marzocchi, Alfred, 4,419,489., Cl. 525-54.500.

Hailey, Laurence N., to Kennecott Corporation. Method of producing composite ceramic articles. 4,419,161., Cl. 156-89.000.

Haines, Stephen W.; Marshall, Stephen R.; Steen, Mark E.; and Swanland, Robert C. Fluid coupling. 4,418,944., Cl. 285-24.000.

Hajek, Bedrich: *See*—
Gillette, Donald J.; and Hajek, Bedrich, 4,418,642., Cl. 118-624.000.

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Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, 4,419,355., Cl. 424-249.000.

Halabiya, Sabah, to Deere & Company. Engine oil passage seal. 4,418,923., Cl. 277-167.500.

Halene, Clemens, to Mannesmann Aktiengesellschaft. Making a seamless spherical case. 4,418,557., Cl. 72-69.000.

Hales, Paul D. Timing device and method. 4,419,548., Cl. 200-38.00R.

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Stepp, Lee W., 4,418,754., Cl. 166-278.000.

Haluda, Raymond P.: *See*—
Johannesen, Donald D.; and Haluda, Raymond P., 4,418,798., Cl. 188-73.450.

Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; and Maruyama, Ryuzaburo, to Nissan Motor Company, Limited. Spark plug for internal combustion engine. 4,419,601., Cl. 313-131.00A.

Hamano, Toshihisa; Ito, Hisao; Takenouchi, Mutsuo; Ozawa, Takashi; Fuse, Mario; and Nakamura, Takeshi, to Fuji Xerox Co., Ltd. Elongate thin-film reader. 4,419,696., Cl. 358-294.000.

Hamed, Gary R.: *See*—
Bohm, Georg G. A.; Vescelius, Lee E.; and Hamed, Gary R., 4,419,469., Cl. 524-68.000.

Hamelin, Patrice R.: *See*—
Beckerick, Philippe J.; Hamelin, Patrice R.; and Fumez, Andre R., 4,419,196., Cl. 204-157.10R.

Hamilton, James. Boat locking device. 4,418,550., Cl. 70-18.000.

Hamilton, Norman L.; and Carpenter, Charles B., to Hamilton, Norman L. Bingo cards rack and card clip. 4,418,913., Cl. 273-150.000.

Hamilton, Stephen P.: *See*—
Hunter, Arthur C.; and Hamilton, Stephen P., 4,419,746., Cl. 365-189.000.

Hammecke, Marie Elise Gisela, heiress: *See*—
Friedrich, Ronald; and Hammecke, Werner, deceased, 4,418,740., Cl. 164-287.000.

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Johannes, Gerhardus A., 4,418,968., Cl. 312-184.000.

Hanover, Barry K.: *See*—
Jacobsen, Stephen C.; Luntz, Richard D.; and Hanover, Barry K., 4,419,092., Cl. 604-20.000.

Hansell, George A., III, to W. L. Gore & Associates, Inc. Under-carpet coaxial cable. 4,419,538., Cl. 174-117.00F.

Hansen, Rolf: *See*—
Lambregts, Antonius A.; and Hansen, Rolf, 4,419,732., Cl. 364-428.000.

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Sanders, William J.; Snyder, Marvin K.; and Harter, James W., 4,418,684., Cl. 126-419.000.

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Galle, Serge; Hautdidier, Jerome; and Soulet, Christian, 4,418,556., Cl. 72-62.000.

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Moreland, Ronald; and Hawkins, Marion L., 4,418,433., Cl. 8-149.100.

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Hayashi, Hideo: *See*—
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Hayashi, Shizuo: *See*—
Ohmori, Tsuguharu; and Hayashi, Shizuo, 4,419,755., Cl. 373-145.000.

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Ishijima, Shizuo; Kiritani, Takeshi; and Hayashi, Yukio, 4,419,134., Cl. 106-87.000.

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Tateoka, Kiyoshi; and Hayashida, Yoshihiro, 4,418,611., Cl. 91-369.00A.

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Morel, Thomas J.; and Haynes, Stewart, Jr., 4,418,753., Cl. 166-273.000.

Healy, James W. Hose mounted fluid mixing sprayer. 4,418,869., Cl. 239-317.000.

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Hegler, Gary G.: *See*—
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Heinrich, Charles E., to TRD Inc. Method and apparatus for operating a self-starting air heating system. 4,418,538., Cl. 60-646.000.

Heise, Brooks B. Blow molding detabber. 4,419,063., Cl. 425-107.000.

Helix Technology Corporation: *See*—
Nicoll, Harry G., 4,418,918., Cl. 277-1.000.

Heller, Anton H., to Poweray Infrared Corporation. Asphalt reclamation unit. 4,418,682., Cl. 126-343.50A.

Heller, Charles H. Device for producing hydrogen and oxygen gases. 4,419,329., Cl. 422-111.000.

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Henderson, Alva E., to Texas Instruments Incorporated. Speech synthesis system with variable interpolation capability. 4,419,540., Cl. 381-51.000.

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Wagaman, Kerry L.; Clark, Chester F.; Henderson, Larry D.; and Jones, W. Steven, 4,419,155., Cl. 149-109.600.

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Reuter, Herbert; Saran, Herbert, deceased; and Witthaus, Martin, 4,419,260., Cl. 252-174.130.

Henley, Edward J.: *See*—
Goeken, John D.; and Henley, Edward J., 4,419,766., Cl. 455-62.000.

Henning, Hans-Joachim; Lahrs, Jurgen; and Liebsch, Dietrich, to Bayer Aktiengesellschaft. Continuous process for the production of organic isocyanates. 4,419,295., Cl. 260-453.0PH.

Henning, Richard, to Bayerische Motoren Werke Aktiengesellschaft. Cylinder head for air-compressing, self-igniting injection internal combustion engine. 4,418,655., Cl. 123-41.82R.

Henry, Nelson R.; Cutler, Duncan B.; and Warner, William L., to Woodman Company, The. Method and apparatus for combination weighing. 4,418,771., Cl. 177-1.000.

Henton, David E.; and O'Brien, Teresa M., to Dow Chemical Company, The. Particle agglomeration in rubber latices. 4,419,496., Cl. 525-301.000.

Henzler, Roland: *See*—
Dettelbach, Alfred; and Henzler, Roland, 4,418,640., Cl. 118-411.000.

Her Majesty the Queen in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources: *See*—
Costerton, John W. F., 4,419,248., Cl. 210-764.000.

Herberg, Helmut, to Siemens Aktiengesellschaft. Thyristor having a controllable emitter short circuit. 4,419,683., Cl. 357-38.000.

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Bankert, Ralph A., 4,419,498., Cl. 525-426.000.
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Hermle, Eduard. Electric proximity sensor. 4,419,646., Cl. 336-90.000.

Herren, Kenneth E., to Deere & Company. Snowblower gearbox assembly. 4,418,485., Cl. 37-244.000.

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Hersom, Albert C.; Wright, Kenneth W.; and Brittain, John E., to Societe d'Assistance Technique pour Produits Nestle S.A. Process for treating solid foodstuff pieces in a container. 4,419,376., Cl. 426-402.000.

Herzog, Max, to Transformatoren Union Aktiengesellschaft. Liquid-cooled transformer for large power ratings. 4,419,647., Cl. 336-92.000.

Hess, Wolfgang, to Lucas Industries Limited. Motorcycle braking system having load sensitive pressure control valve. 4,418,800., Cl. 188-195.000.

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Lutz, Bruce L.; Voth, Harold W.; and Hill, Amos G., 4,418,873., Cl. 241-294.000.

Hetsugi, Seiji, to New Nippon Electric Co., Ltd. Dual cathode-ray tube display system for text editing. 4,419,661., Cl. 340-707.000.
Hettman, Kenneth R. Bottled chemical handling system. 4,418,969., Cl. 312-250.000.
Hevenor, Charles M., Jr., to Gerber Scientific Instrument Company, The. Method for storing and retrieving data. 4,419,740., Cl. 364-900.000.
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Seipel, Winfried, 4,419,648., Cl. 336-215.000.
Heybutzki, Helmut; Krug, Wolfgang; and Seferiadis, Johann, to Kernforschungsanlage Julich GmbH. Pump for very cold liquids. 4,418,544., Cl. 62-55.000.
Heyl & Co. Chemisch-Pharmazeutische Fabrik: *See*—
Bayer, Ernst; and Schumann, Wilhelm, 4,419,490., Cl. 525-61.000.
Hicks, James E., to RCA Corporation. Horizontal deflection circuit. 4,419,608., Cl. 315-408.000.
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Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiko, 4,418,802., Cl. 188-282.000.
Hidasi, Gyorgy: *See*—
Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezso; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, 4,419,524., Cl. 562-506.000.
Hidy, Ivan: *See*—
Elekes, Ilona; Institoria, Laszlo; Medzihradsz, Kalman; Otvos, Laszlo; Medzihradszky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522., Cl. 549-557.000.
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Yoshida, Shin-ichi; Yano, Takemitu; and Higashi, Hidehiro, 4,419,275., Cl. 502-322.000.
Higgins, Michael R. Convection barbecue pit. 4,418,615., Cl. 99-331.000.
Higgins, Rudolph S., to Texasgulf Inc. Multiple-bed solution mining of an inclined structure. 4,418,960., Cl. 299-5.000.
Hildebrand, David B.: *See*—
Gemmell, Robert M.; and Hildebrand, David B., 4,419,594., Cl. 307-297.000.
Hill, Amos G.: *See*—
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Hill, Harold I.; and Targowski, Roger W. Mounting apparatus. 4,419,020., Cl. 374-12.000.
Hill, Stewart C., to Marconi Company Limited, The. Dual feed box horn antenna. 4,419,670., Cl. 343-779.000.
Hille, Martin: *See*—
Diery, Helmut; and Hille, Martin, 4,419,265., Cl. 252-331.000.
Hillstrom, Ernst G. K.: *See*—
Johansson, Lennart R.; and Hillstrom, Ernst G. K., 4,418,997., Cl. 353-111.000.
Himmelwright, Richard S.: *See*—
Falxa, Martin L.; and Himmelwright, Richard S., 4,419,442., Cl. 430-567.000.
Hindersinn, Raymond R., to Occidental Chemical Corporation. Pultruded reinforced phenolic resin products. 4,419,400., Cl. 428-245.000.
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VanNess, David; Hines, Joseph; and Wells, William E., 4,419,300., Cl. 261-106.000.
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Vora, Madhukar B.; and Hingarh, Hermaj K., 4,418,468., Cl. 29-577.00C.
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Kamibayashi, Masato; Tsuchiya, Shinji; and Hiratsuka, Kozo, 4,419,518., Cl. 546-279.000.
Hird, Edwin A. Point locator and graphics digitizer system. 4,419,672., Cl. 346-33.00M.
Hirsch, Arthur E., to J. I. Case Company. Unloading valve for hi-lo-hydraulic system. 4,418,709., Cl. 137-115.000.
Hirtle, Georgina Chrystall: *See*—
John, Frank T., 4,419,650., Cl. 337-119.000.
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Hitachi, Ltd.: *See*—
Fujie, Masakatsu; Matsuno, Junichi; and Furuya, Masao, 4,419,003., Cl. 355-3.0FU.
Fukumoto, Chihiro; Furukawa, Tokinobu; and Oda, Chikao, 4,419,488., Cl. 525-53.000.
Imai, Iwao; and Sone, Masazumi, 4,419,547., Cl. 200-19.00R.
Ishioka, Sachio; Imamura, Yoshinori; Shimomoto, Yasuharu; Ataka, Saburo; Tanaka, Yasuo; and Maruyama, Eiichi, 4,419,604., Cl. 313-385.000.
Muto, Nobuyoshi; Sakai, Keijiro; and Matsuda, Yasuo, 4,419,615., Cl. 318-811.000.
Nate, Kazuo; Kobayashi, Toshio; and Isogai, Tokio, 4,419,506., Cl. 526-316.000.
Sakai, Yoshio; and Nakamura, Hideo, 4,419,684., Cl. 357-40.000.
Sugawara, Yoshitaka; Kamei, Tatsuya; and Sakurai, Tetsuma, 4,419,685., Cl. 357-53.000.
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Hitachi Maxell, Ltd.: *See*—
Ogiro, Kenji; Fujisaki, Masayuki; and Gotoh, Shinichi, 4,419,708., Cl. 360-132.000.
Hitomi, Chiyoji: *See*—
Ichikawa, Rinjiro; and Hitomi, Chiyoji, 4,419,399., Cl. 428-215.000.
Hlavay, Sandor: *See*—
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715., Cl. 137-508.000.
Ho, Stanley S., to Monsanto Company. Phenolic foams. 4,419,460., Cl. 521-123.000.
Hobbs, Charles F., to Monsanto Company. Catalyst and reverse disproportionation process. 4,419,526., Cl. 585-435.000.
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Hoch, Louis; and Lutkowski, Lawrence, to Becton Dickinson and Company. Multiple sample needle assembly. 4,418,703., Cl. 128-766.000.
Hoeberechts, Arthur M. E.: *See*—
Kuhl, Walter H.; Van Leunen, Johannes A. J.; van der Eijk, Bart; van der Bolt, Antonius J. J. M.; and Hoeberechts, Arthur M. E., 4,418,452., Cl. 445-35.000.
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Diery, Helmut; and Hille, Martin, 4,419,265., Cl. 252-331.000.
Niermann, Hermann; Reichert, Gunter; Ebert, Hans; and Neumann, Friedrich, 4,419,104., Cl. 23-293.00R.
Hoffer, John C.: *See*—
Bowen, Terry P.; Caron, Bernard G.; Glover, Douglas W.; and Hoffer, John C., 4,418,983., Cl. 350-96.210.
Hoffer, Steven D.: *See*—
Weber, Kenneth E.; and Hoffer, Steven D., 4,419,191., Cl. 204-1.00T.
Hoffman, Jarett D., to United States of America, Agriculture. Artificial host egg for rearing trichogramma. 4,418,647., Cl. 119-1.000.
Hoffmann, Gerhard: *See*—
Graser, Fritz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,419,427., Cl. 430-58.000.
Hoffmann, Jurgen, to Sartorius GmbH. Tubular filter element for the filtration of fluids. 4,419,241., Cl. 210-493.500.
Hoffmann-La Roche Inc.: *See*—
Petrzilka, Martin, 4,419,262., Cl. 252-299.610.
Hofmann, Gloris R., to Brunswick Corporation. Alternator for ignition system and auxiliary power. 4,418,677., Cl. 123-599.000.
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Hartel, Volker; and Hofmann, Manfred, 4,418,897., Cl. 267-140.100.
Hoge, John H., to Molecrete Corporation. Method of preparing cementitious compositions for tunnel backfill. 4,419,135., Cl. 106-88.000.
Holdstock, Barry C.: *See*—
Atkinson, Ivor B.; and Holdstock, Barry C., 4,419,463., Cl. 523-106.000.
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Dietz, Hermann; Holfelder, Gerhard; Muller, Klaus; and Reber, Harald, 4,419,212., Cl. 204-424.000.
Esper, Friedrich; Frey, Thomas; Geier, Heinz; Holfelder, Gerhard; and Knoll, Gunther, 4,418,661., Cl. 123-145.00A.
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Lang, Josef; Hollaus, Reinhard; Reeh, Ulrike; Denk, Hans; and Habrich, Reiner, 4,419,531., Cl. 136-251.000.
Hollister Incorporated: *See*—
Alexander, Brian S., 4,419,100., Cl. 604-339.000.
Holmes, Allen B., to United States of America, Army. Fluidic valve and pulsing device. 4,418,721., Cl. 137-810.000.
Holtey, Thomas O.; and Miller, Robert C., to Honeywell Information Systems Inc. Hardware for extending microprocesor addressing capability. 4,419,727., Cl. 364-200.000.
Holtrop, John W., to United States of America, Navy. Electrohydraulic control system. 4,418,610., Cl. 91-368.000.
Holzer, Walter. Electro-magnetic valves particularly for household appliances. 4,418,886., Cl. 251-30.000.
Homer Ion Laboratory Co., Ltd.: *See*—
Matsumoto, Junji; Kamiya, Shohei; and Sugihara, Yasuhiko, 4,418,687., Cl. 128-1.00C.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Honeywell Inc.: *See*—
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Holtey, Thomas O.; and Miller, Robert C., 4,419,727., Cl. 364-200.000.
Honga, Masayuki: *See*—
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Boning, Bernward; Nagel, Rudolf; Honig, Gunter; Kiencke, Uwe; and Theuerkauf, Heinz, 4,418,567., Cl. 73-35.000.
Hooper, Neil: *See*—
De Gennaro, Cosmo H.; and Hooper, Neil, 4,419,757., Cl. 375-17.000.
Hopkins, Thomas R., to Lubrizol Corporation, The. Method for continuous production of invert emulsion polymers. 4,419,466., Cl. 523-324.000.
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Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, 4,419,440., Cl. 430-377.000.
Horgan, William J., Jr., to Blumcraft of Pittsburgh. Panic handle for doors. 4,418,949., Cl. 292-92.000.

Horiuchi, Toshiaki: *See—*
Obshita, Masayuki; Horiuchi, Toshiaki; Yamanaka, Takashi; and Usui, Yoshihiro, 4,419,553., Cl. 200-144.00B.
Horsma, David A.: *See—*
Diaz, Stephen H.; and Horsma, David A., 4,419,156., Cl. 156-49.000.
Hort, Eugene V.; Anderson, Lowell R.; and Alwani, Dru W., to GAF Corporation. Corrosion inhibitors containing 3-dialkyl-3-(1-ethylpentyl)-prop-1-yne. 4,419,266., Cl. 252-392.000.
Horton Industries, Inc.: *See—*
Raines, Charles D., 4,418,807., Cl. 192-18.00A.
Horton, Tommy A.; and Augustyn, Michael D., to United States of America, Navy. Apparatus for containing a leakage of PCB compound. 4,419,230., Cl. 210-114.000.
Hoshi, Yoshiyuki: *See—*
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Hosiden Electronics Co., Ltd.: *See—*
Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, 4,419,643., Cl. 335-234.000.
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Hosokawa, Shuuji: *See—*
Mori, Takashi; Hosokawa, Shuuji; and Naito, Takao, 4,418,765., Cl. 173-12.000.
Houle, James F.: *See—*
Noonan, John M.; Ryan, Raymond W.; and Houle, James F., 4,419,437., Cl. 430-270.000.
Howard, Durrell U. Remotely adjustable steering compensator. 4,418,931., Cl. 280-94.000.
Howe, Dennis G., to Eastman Kodak Company. Constant track width optical disk recording. 4,419,750., Cl. 369-111.000.
Howell, Frank H. Aluminum furnace skim recovery system. 4,418,892., Cl. 266-137.000.
Howell, Margene C.: *See—*
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Barrett, James H.; Howell, Thomas J.; and Lein, George M., Jr., 4,419,245., Cl. 210-681.000.
Howley, Peter M.; Sarver, Nava; and Law, Ming-Fan, to United States of America, Health and Human Services. Recombinant DNA process utilizing a papilloma virus DNA as a vector. 4,419,446., Cl. 435-68.000.
Hsiung, Hansen M., to Eli Lilly and Company. Process for de-cyanoethylating blocked nucleotides. 4,419,509., Cl. 536-27.000.
Hsu, Charles J. Water detecting or absorbing device for use in and removal from a tank with a limited opening. 4,419,236., Cl. 210-282.000.
Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, to Exxon Research and Engineering Co. Electrical coalescense of liquid emulsions. 4,419,200., Cl. 204-186.000.
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Balaza, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715., Cl. 137-508.000.
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Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, 4,419,200., Cl. 204-186.000.
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Winkelman, Henry T., Jr.; and Huckaby, Edward E., 4,418,967., Cl. 312-107.000.
Hudson, George A., deceased (by White, Richard L., administrator); and Reiff, Helmut F., to Mobay Chemical Corporation. Aliphatic solvent compatible isocyanates. 4,419,293., Cl. 260-453.0AB.
Hudson, Hal R.: *See—*
Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., 4,418,507., Cl. 52-241.000.
Hudson's Bay Oil and Gas Company Limited: *See—*
Jagodzinski, Richard F.; and Kerr, Richard K., 4,419,337., Cl. 423-574.00R.
Huggins, Orville C.; and Mistyurik, John D., to Monarch Marking Systems, Inc. Label printing apparatus with constant pressure printing mechanism. 4,418,618., Cl. 101-68.000.
Hughes Aircraft Company: *See—*
Peters, John W., 4,419,385., Cl. 427-99.000.
Wysocki, Joseph A.; Blair, George R.; and Vince, Michael R., 4,418,984., Cl. 350-96.330.
Hughes Helicopters, Inc.: *See—*
Price, Leonard W., 4,418,607., Cl. 89-33.0CA.
Hughes, Jack. Pistol and removable cartridge shaped barrel insert. 4,418,488., Cl. 42-75.00B.
Huljak, Robert J.: *See—*
Bowlds, Patsy A.; Cassidy, Bruce M.; Graham, Arthur E.; Huljak, Robert J.; Stafford, Donald W.; and Tao, Deh C., 4,419,024., Cl. 400-120.000.
Hundt, Eckart; and Trautenberg, Elmar, to Siemens Aktiengesellschaft. Method for processing ultrasonic echo signals of both directionally reflecting as well as nondirectionally scattering objects, particularly for ultrasonic image processing in the field of substance or tissue investigation. 4,418,575., Cl. 73-607.000.
Hunter, Arthur C.; and Hamilton, Stephen P., to Texas Instruments Incorporated. Multiple pointer memory system. 4,419,746., Cl. 365-189.000.
Hunter, John J. Apparatus for making pipe coupling joint. 4,418,458., Cl. 29-237.000.
Hunter, Le Roy: *See—*
Pong, Richard G. S.; Nandagiri, Arun; Bilynskyj, Oleh M.; and Hunter, Le Roy, 4,418,846., Cl. 222-189.000.
Huon, Simon: *See—*
Cholat-Namy, Jean; Huon, Simon; and Thirion, Philippe, 4,419,751., Cl. 370-13.000.
Hurley, James R.: *See—*
Jindrick, James A.; Hurley, James R.; Gilker, Clyde; Nohria, Naresh K.; Baranowski, James A.; and Dolnik, Thomas G., 4,419,619., Cl. 323-257.000.
Husch, Bruno: *See—*
Schneider, Rudolf; and Husch, Bruno, 4,418,520., Cl. 56-297.000.
Hutchinson-Mapa: *See—*
Bertin, Jacques; Pompei, Michel; and Valjent, Jean-Pierre, 4,418,895., Cl. 267-140.100.
Huzyak, Paul E., to Gulf & Western Manufacturing Co. Roll coolant distribution header. 4,418,559., Cl. 72-201.000.
Hwang, Ying-Chen: *See—*
Naster, Ronald J.; Zaidel, Simon A.; Hwang, Ying-Chen; Parks, Earl L.; and Cady, William R., 4,418,470., Cl. 29-577.00C.
Hyde, Jack, to Koppers Company, Inc. Blast furnace stove wall. 4,419,075., Cl. 432-217.000.
Hyder, Marvin W.; and Weinstock, Steven F., to Leslie Metal Arts Company. Rotary-position catch for rotatable shelf units. 4,418,970., Cl. 312-305.000.
I-Temp Corporation: *See—*
Larson, Roger R., 4,419,166., Cl. 156-272.400.
Ichikawa, Rinjiro; and Hitomi, Chiyoji, to Toyo Boseki Kabushiki Kaisha. Transparent conductive film. 4,419,399., Cl. 428-215.000.
Ichinose, Shiro; Machida, Saneto; Murakami, Shotoku; and Furusawa, Teruo, to Toshin Kogyo Co. Ltd. Apparatus for intermittently driving endless belt in automatic screen printing machine. 4,419,613., Cl. 318-632.000.
Iijima, Yasuo: *See—*
Tachikawa, Kyoji; Sekine, Hisashi; Itoh, Kikuo; and Iijima, Yasuo, 4,419,145., Cl. 148-11.50F.
Ikenoue, Shinpei: *See—*
Mifune, Hiroyuki; Fuseya, Yoshiharu; and Ikenoue, Shinpei, 4,419,443., Cl. 430-600.000.
Ikezawa, Kenji: *See—*
Oshima, Masaharu; Ikezawa, Kenji; and Aoki, Hiroyuki, 4,419,213., Cl. 204-425.000.
Illinois Tool Works Inc.: *See—*
Arthur, Ronald H., 4,419,546., Cl. 200-11.00G.
Imai, Iwao; and Sone, Masazumi, to Nissan Motor Company, Ltd.; and Hitachi, Ltd. Ignition distributor for internal combustion engine. 4,419,547., Cl. 200-19.00R.
Imai, Iwao: *See—*
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,418,660., Cl. 123-143.00B.
Imai, Kazuhiro; Tamura, Zenzo; and Kobayashi, Shin-ichiro, to Yamanouchi Pharmaceutical Co., Ltd. Method of detecting fluorescent materials and apparatus for their detection. 4,419,452., Cl. 436-89.000.
Imai, Koji: *See—*
Irokawa, Shoichi; Imai, Koji; Sakurai, Takeichi; and Goto, Kiyoshi, 4,419,591., Cl. 307-45.000.
Imai, Takashi: *See—*
Yamanaka, Tohr; and Imai, Takashi, 4,419,292., Cl. 260-410.90R.
Imamura, Yoshinori: *See—*
Ishioka, Sachio; Imamura, Yoshinori; Shimomoto, Yasuharu; Ataka, Saburo; Tanaka, Yasuo; and Maruyama, Eiichi, 4,419,604., Cl. 313-385.000.
Imperial Chemical Industries PLC: *See—*
Backhouse, Alan J.; Bromley, Charles; and Thompson, Morice W., 4,419,465., Cl. 523-201.000.
Rose, John B., 4,419,486., Cl. 525-534.000.
Smith, Leslie H., 4,419,363., Cl. 424-285.000.
Imura, Toshinori: *See—*
Tominaga, Shinji; Imura, Toshinori; and Nakamura, Ikushi, 4,419,001., Cl. 354-173.100.
Inagaki, Junichi: *See—*
Yamaura, Mitsuru; Kondow, Ryotaro; Inagaki, Junichi; and Matsuzawa, Kunio, 4,419,737., Cl. 364-900.000.
Inagaki, Koichi: *See—*
Yuta, Yukio; and Inagaki, Koichi, 4,418,986., Cl. 350-128.000.
Inata, Hiroo: *See—*
Matsumura, Shunichi; and Inata, Hiroo, 4,419,308., Cl. 264-49.000.
Indata Corporation: *See—*
Wolfson, William; Grondstra, Jan W.; and Jarva, Curt, 4,419,734., Cl. 364-567.000.
Industrie Pirelli Societa per Azioni: *See—*
Ferrentino, Antonio, 4,419,157., Cl. 156-56.000.
Ingard, Karl U.: *See—*
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., 4,418,788., Cl. 181-224.000.
Ingersoll-Rand Company: *See—*
Chulada, Edmund C.; and Nelson, David A., 4,419,090., Cl. 494-53.000.
Inkares AG: *See—*
Schneider, Helmut, 4,418,832., Cl. 220-260.000.
Inoue, Naomitsu: *See—*
Saeki, Yukio; and Inoue, Naomitsu, 4,419,477., Cl. 524-290.000.

Inoue, Yozo: *See*—
Ito, Yoji; Inoue, Yozo; and Hara, Kiyoshi, 4,419,730., Cl. 364-424.000.
Institoris, Laszlo: *See*—
Elekes, Ilona; Institoris, Laszlo; Medzihradsz, Kalman; Otvos, Laszlo; Medzihradszky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522., Cl. 549-557.000.
Institut Francais du Petrole: *See*—
Ecomard, Andre, 4,418,535., Cl. 60-602.000.
Institut National de la Sante et de la Recherche Medicale-INSERM: *See*—
Quash, Gerard A., 4,419,444., Cl. 435-7.000.
Instrumentarium Oy: *See*—
Kinanen, Ilmari, 4,419,764., Cl. 378-153.000.
International Business Machines Corp.: *See*—
Ainslie, Norman G.; Krzanowski, James E.; and Palmateer, Paul H., 4,418,857., Cl. 228-124.000.
Bahr, Dietrich J.; and Briska, Marian, 4,419,392., Cl. 427-404.000.
Blum, Arnold, 4,419,739., Cl. 364-900.000.
Bowlds, Patsy A.; Cassidy, Bruce M.; Graham, Arthur E.; Huljak, Robert J.; Stafford, Donald W.; and Tao, Deh C., 4,419,024., Cl. 400-120.000.
Burkhart, Robert W.; Cox, Allen R.; and Hartley, John D., 4,418,473., Cl. 29-603.000.
Cholat-Namy, Jean; Huon, Simon; and Thirion, Philippe, 4,419,751., Cl. 370-13.000.
Grombone, Anthony; and Van Cleave, George W., 4,419,010., Cl. 355-133.000.
Harper, James M. E.; Heiblum, Mordehai; and Kaufman, Harold R., 4,419,203., Cl. 204-192.00R.
Kellogg, Robert M., 4,418,945., Cl. 285-70.000.
Locke, Charles H., 4,419,714., Cl. 361-321.000.
Norgren, Kent S.; and Stucka, Stephen E., 4,419,592., Cl. 307-241.000.
International Computers Limited: *See*—
Johnson, Kenneth C., 4,419,638., Cl. 333-217.000.
International Design Corporation: *See*—
Woods, William D.; and Pigman, John H., 4,418,901., Cl. 269-71.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M., 4,419,280., Cl. 252-522.00R.
International Harvester Co.: *See*—
Boetto, Charles, 4,418,763., Cl. 172-776.000.
International Paper Company: *See*—
McFarland, William W.; and Beavers, Baxter, 4,418,861., Cl. 229-23.00A.
International Power Technology, Inc.: *See*—
Cheng, Dah Y.; and Wiersma, Steve J., 4,419,187., Cl. 202-200.000.
Cheng, Dah Y.; and Wiersma, Steve J., 4,419,242., Cl. 210-500.200.
International Standard Electric Corporation: *See*—
Crossland, William A.; Coates, David; and Ayliffe, Peter J., 4,419,664., Cl. 340-784.000.
Ege, Sigmund, 4,419,056., Cl. 417-426.000.
Roberts, Daniel F. T., 4,419,146., Cl. 148-23.000.
Iomega Corporation: *See*—
Brower, Ralph D.; and Losee, Paul D., 4,419,705., Cl. 360-103.000.
Radman, Anton J.; Bauck, Randall C.; and Kleczkowski, Peter S., 4,419,704., Cl. 360-102.000.
Ionna, Samuel A., to Williamson Company, The. Duct fitting. 4,418,943., Cl. 285-12.000.
Iowa State University Research Foundation, Inc.: *See*—
Claar, Paul W., 4,418,932., Cl. 280-112.00R.
Irie, Kenji: *See*—
Kushida, Machiro; Takasugi, Tsuneji; and Irie, Kenji, 4,419,409., Cl. 428-469.000.
Irokawa, Shoichi; Imai, Koji; Sakurai, Takeichi; and Goto, Kiyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Multiterminal DC power transmission system. 4,419,591., Cl. 307-45.000.
Isaka, Akihiko, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Drive shaft supporting device for a music box with a plate frame. 4,418,603., Cl. 84-95.00R.
Ishida, Hiroaki, to Seiko Koki Kabushiki Kaisha. Automatic focusing device for the camera. 4,418,998., Cl. 354-405.000.
Ishida, Minoru: *See*—
Murakami, Ryoichi; Shimizu, Hideo; Yoshii, Takashi; Ishida, Minoru; and Yonekura, Hiroto, 4,419,147., Cl. 148-31.500.
Ishida, Takashi: *See*—
Tominari, Noboru; and Ishida, Takashi, 4,418,673., Cl. 123-478.000.
Ishiguro, Mamoru: *See*—
Fuchigami, Mitsuru; Ishiguro, Mamoru; and Ohye, Hideo, 4,418,941., Cl. 282-27.500.
Ishihara, Hideo; Ohshita, Takahiro; and Saito, Harumitsu, to Ebara Corporation. Thermal reactor of fluidizing bed type. 4,419,330., Cl. 422-143.000.
Ishihara, Kiyomitsu, to Yoshida Kogyo K. K. Automatic control of the length of article row to be injection-molded. 4,419,306., Cl. 264-40.500.
Ishii, Toshihiko; and Sato, Tadao, to National Institute for Researches in Inorganic Materials. Process for producing rhombohedral system boron nitride. 4,419,335., Cl. 423-290.000.
Ishijima, Shizuo; Kiritani, Takeshi; and Hayashi, Yukio, to Asahi Kasei Kogyo Kabushiki Kaisha. Organic phosphoric ester containing water-dispersible aluminum paste as foaming agent in light-weight foamed concrete. 4,419,134., Cl. 106-87.000.
Ishikawa, Shozo: *See*—
Katagiri, Kazuharu; Ishikawa, Shozo; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,419,428., Cl. 430-77.000.
Ishikawa, Yasuki: *See*—
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,418,660., Cl. 123-143.00B.
Ishioka, Sachio; Imamura, Yoshinori; Shimomoto, Yasuharu; Ataka, Saburo; Tanaka, Yasuo; and Maruyama, Eiichi, to Hitachi, Ltd. Light sensitive screen. 4,419,604., Cl. 313-385.000.
Ishizaki, Morio, to Ishizaki Press Kogyo Co., Ltd. Battery container and lid. 4,419,420., Cl. 429-185.000.
Ishizaki Press Kogyo Co., Ltd.: *See*—
Ishizaki, Morio, 4,419,420., Cl. 429-185.000.
Isobe, Yukihiro; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, to TDK Electronics Co., Ltd. Magnetic recording medium and production thereof. 4,419,406., Cl. 428-422.000.
Isogai, Tokio: *See*—
Nate, Kazuo; Kobayashi, Toshio; and Isogai, Tokio, 4,419,506., Cl. 526-316.000.
Issleib, Juergen: *See*—
Krautkremer, Franz; and Issleib, Juergen, 4,418,633., Cl. 114-144.00E.
Italtractor ITM S.p.A.: *See*—
Grilli, Walter; De Meo, Franco; and Franchini, Ivan, 4,419,152., Cl. 148-12.00F.
Ito, Hideo; and Yabuta, Keiichiro, to Nissan Motor Company, Limited. Method of steering a wheeled vehicle having at least two pairs of steerable road wheels. 4,418,780., Cl. 180-142.000.
Ito, Hisao: *See*—
Hamano, Toshihisa; Ito, Hisao; Takenouchi, Mutsuo; Ozawa, Takashi; Fuse, Mario; and Nakamura, Takeshi, 4,419,696., Cl. 358-294.000.
Ito, Osamu; and Nishizawa, Kazunori, to Kao Soap Co., Ltd. Twisted yarn and twisted bundle of yarns. 4,418,524., Cl. 57-239.000.
Ito, Tadao; and Hashimoto, Akio, to Nippon Light Metal Company Limited. Method for manufacture of aluminum alloy casting. 4,419,143., Cl. 148-3.000.
Ito, Takashi: *See*—
Taguchi, Masao; and Ito, Takashi, 4,419,743., Cl. 365-149.000.
Ito, Yoichiro: *See*—
Kolobow, Theodor; and Ito, Yoichiro, 4,419,089., Cl. 494-45.000.
Ito, Yoji; Inoue, Yozo; and Hara, Kiyoshi, to Nippondenso Co., Ltd. Method and system for controlling the setting temperature of a vehicle air conditioner. 4,419,730., Cl. 364-424.000.
Itoh, Kikuo: *See*—
Tachikawa, Kyoji; Sekine, Hisashi; Itoh, Kikuo; and Iijima, Yasuo, 4,419,145., Cl. 148-11.50F.
Itoh, Yoshiyasu: *See*—
Etoh, Kuniomi; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, 4,419,438., Cl. 430-275.000.
Itou, Hiroshi: *See*—
Yamauchi, Yasutaka; and Itou, Hiroshi, 4,418,666., Cl. 123-339.000.
ITT Industries, Inc.: *See*—
Miskin, Leslie; and Flamm, Peter M., 4,419,688., Cl. 358-27.000.
Sprockhoff, Volker, 4,418,963., Cl. 303-3.000.
Weiler, Rolf; and Bohm, Peter, 4,418,613., Cl. 92-98.00D.
Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor wafer with alignment marks and method for manufacturing semiconductor device. 4,418,467., Cl. 29-574.000.
Iwamoto, Kenzi; and Kuroyanagi, Makoto, to Nippon Soken, Inc. Supercharger for an internal combustion engine. 4,418,537., Cl. 60-611.000.
Iwao, Suminari, to Honda Giken Kogyo Kabushiki Kaisha. Carburetion system for a V-type internal combustion engine. 4,418,676., Cl. 123-580.000.
Iwata, Kazuroh: *See*—
Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiko, 4,418,802., Cl. 188-282.000.
Izume, Takatomo; and Okado, Chihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Resistive welder having a controlled output voltage unaffected by secondary circuit disconnection. 4,419,559., Cl. 219-110.000.
J. I. Case Company: *See*—
Fralish, Mark R., 4,418,519., Cl. 56-244.000.
Hirsch, Arthur E., 4,418,709., Cl. 137-115.000.
Pedersen, Carl O.; and Maurer, Herman J., 4,419,040., Cl. 414-687.000.
J. M. Voith GmbH: *See*—
Laucks, Rudolf; and Blickle, Karl, 4,419,085., Cl. 440-93.000.
Jackman, Anthony D., to Bettix Limited. Single-mouth squeeze-bottle dispensing container. 4,418,843., Cl. 222-158.000.
Jackson, W. Shaun; and Bohm, Leslie E. Pannier and mounting arrangement for cycles. 4,418,850., Cl. 224-32.00A.
Jacob, Ezekiel J.: *See*—
Cooper, Sidney; and Jacob, Ezekiel J., 4,419,430., Cl. 430-109.000.
Jacobs, Morton: *See*—
Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., 4,418,561., Cl. 72-406.000.
Jacobsen, Stephen C.; Luntz, Richard D.; and Hanover, Barry K., to Motion Control, Inc. Iontophoretic electrode structure. 4,419,092., Cl. 604-20.000.
Jacobson, Irvin D.; Volgstadt, Frank R.; and Passerell, David P., to Perfection Corporation. Angle cock valve. 4,418,888., Cl. 251-216.000.

Jacobson, Robert L., administrator: *See*—
Santilli, Donald S.; and Blakely, Donald W., deceased, 4,419,273., Cl. 502-80.000.

Jagodzinski, Richard F.; and Kerr, Richard K., to Hudson's Bay Oil and Gas Company Limited; and Alberta Energy Company Ltd. Process and apparatus for reacting sulphur-containing material with oxidizing gas. 4,419,337., Cl. 423-574.00R.

Jalali, Bijan; and Tran, Luan G., to Mattel, Inc. Electronic target game. 4,418,917., Cl. 273-313.000.

James, Claude: *See*—
Debarre, Francois; Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,419,356., Cl. 424-251.000.

Jan Stenerud and Company, Inc.: *See*—
Stenerud, Jan, 4,418,910., Cl. 273-55.00B.

Janes, George S.; and Schlier, Robert E., to Jersey Nuclear-Avco Isotopes, Inc. Use of autoionization transition absorption peaks in isotopically selective photoexcitation. 4,419,582., Cl. 250-424.000.

Janzito, Richard, to Martin Distributors. Triple contact seal. 4,418,922., Cl. 277-152.000.

Japan Marine Machinery Development Association: *See*—
Yoshimi, Kazuhiko; Shimizu, Kazuyuki; Watari, Takashi; and Kusumoto, Katsunori, 4,418,632., Cl. 114-102.000.

Japan Storage Battery Company Ltd.: *See*—
Sakai, Yasuharu; Murai, Nobuaki; and Nakano, Kiyotaka, 4,418,562., Cl. 72-444.000.

Jarosz, Anthony M.; and Stevens, Randy R., to T. J. Company. Portable combination lamp, smoke detector and power failure alarm. 4,419,658., Cl. 340-521.000.

Jarva, Curt: *See*—
Wolfson, William; Grondstra, Jan W.; and Jarva, Curt, 4,419,734., Cl. 364-567.000.

Jasys, Vytautas J.: *See*—
Crawford, Thomas C.; and Jasys, Vytautas J., 4,419,284., Cl. 260-245.20R.

Jayawant, Madhusudan D., to Du Pont de Nemours, E. I., and Company. Removal of heavy metal ions. 4,419,246., Cl. 210-721.000.

Jeneric Industries, Inc.: *See*—
Prasad, Arun, 4,419,325., Cl. 420-464.000.

Jensen, Ole R., to E. R. Squibb & Sons, Inc. Apparatus for manufacturing ostomy pouches. 4,419,174., Cl. 156-513.000.

JEOL Ltd.: *See*—
Nakagawa, Seiichi, 4,419,581., Cl. 250-396.0ML.

Jerome, Robert J.: *See*—
Teyssie, Philippe J.; Jerome, Robert J.; and Broze, Guy J., 4,419,482., Cl. 524-560.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Janes, George S.; and Schlier, Robert E., 4,419,582., Cl. 250-424.000.

Jewusiak, Stephen J.: *See*—
Beroff, Howard; Doddi, Namassivaya; and Jewusiak, Stephen J., 4,418,694., Cl. 128-326.000.

Jin, Sungho, to Bell Telephone Laboratories, Incorporated. High-remanence Fe-Ni and Fe-Ni-Mn alloys for magnetically actuated devices. 4,419,148., Cl. 148-120.000.

Jindrick, James A.; Hurley, James R.; Gilker, Clyde; Nohria, Naresh K.; Baranowski, James A.; and Dolnik, Thomas G., to McGraw-Edison Company. Microprocessor controlled voltage regulating transformer. 4,419,619., Cl. 323-257.000.

Jobst Institute, Inc.: *See*—
Montgomery, John R., 4,418,477., Cl. 33-179.000.
Mummert, Thomas A., 4,418,690., Cl. 128-24.00R.

Joby, Michael J., to Lucas Industries Limited. Fuel systems for gas turbine engines. 4,418,529., Cl. 60-39.281.

Joh, Choon S. Deodorizing boot stand. 4,418,434., Cl. 12-128.00B.

Johannes, Gerhardus A., to Handelmaatschappij Twentex B.V. Filing cabinet. 4,418,968., Cl. 312-184.000.

Johannesen, Donald D.; and Haluda, Raymond P., to Bendix Corporation, The. Disc brake with wedge pins. 4,418,798., Cl. 188-73.450.

Johansson, Lennart R.; and Hillstrom, Ernst G. K., to Victor Hasselblad Aktiebolag. Slide projector with circular slides magazine. 4,418,997., Cl. 353-111.000.

John, Frank T., to Hirtle, Georgina Chrystall. Liquid contact relay incorporating gas-containing finely reticular solid motor element for moving conductive liquid. 4,419,650., Cl. 337-119.000.

John Wyeth and Brother Limited: *See*—
Crossley, Roger; and Dickinson, Kay H., 4,419,362., Cl. 424-273.00R.

John Zink Company: *See*—
Schwartz, Robert, 4,419,071., Cl. 431-202.000.

Johnsen & Jorgensen Limited: *See*—
Mancini, Gerardo; Searle, Richard J.; and Davis, Eugene E., 4,418,826., Cl. 215-231.000.

Johnson, David W., Jr.; MacChesney, John B.; and Rabinovich, Eliezer M., to Bell Telephone Laboratories, Incorporated. Fabrication of sintered high-silica glasses. 4,419,115., Cl. 65-3.120.

Johnson, Edwin A.; and Leung, Chun K., to Bendix Corporation, The. Fuel distribution control system for an internal combustion engine. 4,418,669., Cl. 123-436.000.

Johnson, Kenneth C., to International Computers Limited. Negative resistance element. 4,419,638., Cl. 333-217.000.

Johnson, Kenneth R., to Rexham Corporation. Machine and method for making substantially air-free sealed pouches. 4,418,512., Cl. 53-434.000.

Johnson, Oliver W., to Eaton Corporation. Pilot control valve for load sensing hydraulic system. 4,418,710., Cl. 137-117.000.

Johnson, Ralph B.: *See*—
Modisette, James E.; and Johnson, Ralph B., 4,419,692., Cl. 358-113.000.

Johnson, Rheuben C. Three compartment travel bag. 4,418,806., Cl. 190-111.000.

Johnson, Richard C.; Seshamani, Venkatraman; and Egbert, Leigh B., to Foster Wheeler Energy Corporation. Fluidized bed heat exchanger having an insulated fluid cooled air distributor plate assembly. 4,418,650., Cl. 122-4.00D.

Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., to Amca International Corporation. Apparatus for manufacture of tunnel tubes. 4,418,561., Cl. 72-406.000.

Jon, Min-Chung; and Palazzo, Vito, to Western Electric Co., Inc. Nondestructive real-time method for monitoring the quality of a weld. 4,419,562., Cl. 219-130.010.

Jones, Gordon H.; and Young, John, to Syntex (U.S.A.) Inc. Naphthoquinone anti-psoriatic agents. 4,419,368., Cl. 424-331.000.

Jones, Gordon H.: *See*—
Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., 4,419,347., Cl. 424-177.000.

Jones, Richard W. Apparatus and method for sampling a liquid. 4,418,581., Cl. 73-864.340.

Jones, W. Steven: *See*—
Wagaman, Kerry L.; Clark, Chester F.; Henderson, Larry D.; and Jones, W. Steven, 4,419,155., Cl. 149-109.600.

Jordan, Carmel T. Modular animal trap. 4,418,493., Cl. 43-67.000.

Jordan, Larry T., to Seeq Technology, Inc. Method and device for providing process and test information in semiconductors. 4,419,747., Cl. 365-201.000.

Josef, Michael J.; and Lanthier, Joseph D., to Albany International Corp. Double loop seam for corrugator belts. 4,418,726., Cl. 139-383.00A.

Jozwiak, Stanley E., Jr.: *See*—
Gerboth, Patrick L.; and Jozwiak, Stanley E., Jr., 4,419,049., Cl. 415-206.000.

Julian, John D. Electrodes for electrochemical cells current generating cells and rechargeable accumulators. 4,419,424., Cl. 429-217.000.

Jurgen, Hofmann: *See*—
Reus, Josef; Wewer, Hans; and Jurgen, Hofmann, 4,419,333., Cl. 423-235.000.

K-Three Products Kabushiki Kaisha: *See*—
Akiyama, Toshimitsu; and Kasamatsu, Tadashi, 4,419,173., Cl. 156-470.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Fukuda, Masao, 4,418,772., Cl. 177-1.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Isaka, Akihiko, 4,418,603., Cl. 84-95.00R.

Kadnikova, Galina I.: *See*—
Kolesnik, Anatoly G.; Kadnikova, Galina I.; Morozova, Lilia V.; and Boginskaya, Lidia M., 4,419,341., Cl. 424-52.000.

Kajita, Shuji: *See*—
Fujiwara, Takashi; Kajita, Shuji; Matsushita, Tetsuo; and Manabe, Seiichi, 4,419,317., Cl. 264-184.000.

Kalbskopf, Reinhard; and Baumberger, Otto, to Societa Italiana Vetro - SIV - S.p.A. Heating glass pane. 4,419,570., Cl. 219-522.000.

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Kalthoff, Jorg F.; and Winkler, Siegfried, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung. Method of determining the impact fracture toughness K_{ID} by means of impact tests. 4,418,563., Cl. 73-12.000.

Kamei, Tatsuya: *See*—
Sugawara, Yoshitaka; Kamei, Tatsuya; and Sakurai, Tetsuma, 4,419,685., Cl. 357-53.000.

Kamibayashi, Masato; Tsuchiya, Shinji; and Hiratsuka, Kozo, to Tokyo Tanabe Co. L.T.D. 1,4-Dihydropyridine derivatives. 4,419,518., Cl. 546-279.000.

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Matsumoto, Junji; Kamiya, Shohei; and Sugihara, Yasuhiko, 4,418,687., Cl. 128-1.00C.

Kamyr AB: *See*—
Backlund, Ake, 4,419,184., Cl. 162-49.000.

Kanazawa, Akira, to Olympus Optical Co., Ltd. Laser device for an endoscope. 4,418,689., Cl. 128-6.000.

Kane, John F.; and Weinhold, Kerry L., to Armstrong World Industries, Inc. Apparatus and process for ultrasonically identifying and coating articles having differing characteristics. 4,419,384., Cl. 427-57.000.

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Rosenberg, Barnett; Van Camp, Loretta; Ficher, Robert G.; Kansy, Samir; Peresie, Henry J.; and Davidson, James P., 4,419,351., Cl. 424-245.000.

Kanto Jidosha Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Junji; and Harada, Shingo, 4,418,956., Cl. 296-216.000.

Kao Soap Co., Ltd.: *See*—
Ito, Osamu; and Nishizawa, Kazunori, 4,418,524., Cl. 57-239.000.

Kaplan, Alan, to Emkay Manufacturing Company. Crystal plating method. 4,419,379., Cl. 427-10.000.

Karger, Robert, to Vereinigte Elektrizitatswerke Westfalen Aktiengesellschaft. Process for cooling and separating chlorides and fluorides from gas mixtures. 4,419,334., Cl. 423-240.000.

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Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. N-Substituted polyalkylpiperidine-4-spirooxazolones. 4,419,512., Cl. 544-70.000.

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Kasai, Shin: *See*—
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Kasori, Mituo; Takano, Takeshi; Maki, Hironori; and Ogino, Naohiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Multi-component glass optical fiber for optical communication. 4,418,985., Cl. 350-96.340.

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Kasugayama, Yukio; Terasawa, Koji; and Hattori, Yoshihumi, to Canon Kabushiki Kaisha. Ink jet recording apparatus. 4,419,677., Cl. 346-140.00R.

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Katagiri, Kazuharu; Ishikawa, Shozo; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, to Copyer Co., Ltd.; and Canon Inc. Electrophotographic light-sensitive media having a dis-azo compound. 4,419,428., Cl. 430-77.000.

Katagiri, Masayoshi; Nomura, Yoshihisa; Kawaguchi, Hiroshi; Nishina, Shuho; and Miura, Eiji, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Braking hydraulic pressure control valve in a dual-circuit brake system. 4,418,964., Cl. 303-6.00C.

Kato, Eiichi: *See*—
Kuwazima, Shigeru; Kato, Eiichi; and Yamada, Minoru, 4,419,439., Cl. 430-375.000.

Kato, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Vacuum circuit interrupter and method of producing the same. 4,419,551., Cl. 200-144.00B.

Katoh, Yoshio: *See*—
Etoh, Kuniomi; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, 4,419,438., Cl. 430-275.000.

Kaucic, Robert A.: *See*—
Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., 4,418,561., Cl. 72-406.000.

Kaufeldt, Roland. Device for automatically tightening spokes in spoke wheels. 4,418,738., Cl. 157-1.550.

Kauffman, Allen L., to General Motors Corporation. Hydraulic system pressure control for a power transmission. 4,418,587., Cl. 74-867.000.

Kaufman, Benjamin J.; Sawicki, Robert A.; and Levine, Stephen A., to Texaco Inc. Lubricating oil containing keto amide as friction reducing agent. 4,419,255., Cl. 252-51.50A.

Kaufman, Harold R.: *See*—
Harper, James M. E.; Heiblum, Mordehai; and Kaufman, Harold R., 4,419,203., Cl. 204-192.00R.

Kaus, Wolfgang: *See*—
Muncke, Ludwig; and Kaus, Wolfgang, 4,418,955., Cl. 296-190.000.

Kawabata, Takashi; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, to Canon Kabushiki Kaisha. Focus detecting device with varying pitch cylindrical lens element. 4,419,574., Cl. 250-204.000.

Kawaguchi, Hiroshi: *See*—
Katagiri, Masayoshi; Nomura, Yoshihisa; Kawaguchi, Hiroshi; Nishina, Shuho; and Miura, Eiji, 4,418,964., Cl. 303-6.00C.

Kawaguchi, Yutaka: *See*—
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Kawakami, Hiromi: *See*—
Yamamoto, Yoshihiro; Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, 4,419,695., Cl. 358-198.000.

Kawamura, Yoshio, to Kawasaki Jukogyo Kabushiki Kaisha. Air cleaner. 4,419,112., Cl. 55-480.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Kawamura, Yoshio, 4,419,112., Cl. 55-480.000.

Kawasaki, Teruo; Kogawa, Kouichi; and Nomura, Hiroyuki, to Nissan Motor Company, Limited. Wiper intermittent motion control device. 4,419,611., Cl. 318-443.000.

Kearney-National, Inc.: *See*—
Osborne, Anthony, 4,419,549., Cl. 200-50.00A.

Keating, Kenneth B.: *See*—
Breda, Ernest J.; and Keating, Kenneth B., 4,419,198., Cl. 204-180.00P.

Kehl, Christof, to Dr. -Ing. Rudolf Hell GmbH. Method for the visual inspection of the reproduction quality of drawing elements and elements for the execution of the method. 4,419,426., Cl. 430-30.000.

Keil, Rudolf; Auracher, Franz; and Stockmann, Michael, to Siemens Aktiengesellschaft. Planar waveguide lens, its utilization and method for its manufacture. 4,418,980., Cl. 350-96.130.

Keiun, Kodo. Fuel supplement supplying device for an internal combustion engine. 4,418,654., Cl. 123-25.00A.

Kelley, Donald W.: *See*—
Greene, C. Lawrence; Creech, David C.; and Kelley, Donald W., 4,419,372., Cl. 426-104.000.

Kellogg, Robert M., to International Business Machines Corporation. Sterile connectors. 4,418,945., Cl. 285-70.000.

Kelly, John A.; and Soderquist, Cynthia A., to Nalco Chemical Company. Method of scavenging dissolved oxygen in steam generating equipment using ammonia or amine neutralized erythorbic acid. 4,419,327., Cl. 422-17.000.

Kelly, Joseph D.: *See*—
Valimont, James L.; and Kelly, Joseph D., 4,419,176., Cl. 156-556.000.

Kelly, Robert H.: *See*—
Moyer, Anthony M.; and Kelly, Robert H., 4,418,509., Cl. 52-693.000.

Kelm, Edward C.; and Kurtin, Stephen. Tone activated hold circuit. 4,419,543., Cl. 179-81.00R.

Kelso, Charles R.; and Walter, Richard P., to Bendix Corporation, The. Dual solenoid distributor pump. 4,418,671., Cl. 123-450.000.

Kendall Company, The: *See*—
Patel, Bhupendra C., 4,419,094., Cl. 604-93.000.
Van Overloop, Ronald R., 4,419,568., Cl. 219-441.000.

Kendall, James M.; and Walsh, John V., to United States of America, National Aeronautics and Space Administration. Pressure letdown method and device for coal conversion systems. 4,418,722., Cl. 138-42.000.

Kenlock Corporation: *See*—
Takahashi, Shoichiro, 4,419,025., Cl. 403-14.000.

Kennecott Corporation: *See*—
Hailey, Laurence N., 4,419,161., Cl. 156-89.000.

Kennedy, Carl S.; and Hack, Theodore A., to Nalco Chemical Company. Synthetic post-pickle fluid. 4,419,253., Cl. 252-34.700.

Kennedy, Melvin R.; and Nagel, Dietmar, to Buddy L Corporation. Miniature racing vehicle and wrist-borne launching platform assembly. 4,418,495., Cl. 46-206.000.

Kenney, Theodore W. Trouble lamp. 4,419,720., Cl. 362-285.000.

Kernforschungsanlage Julich GmbH: *See*—
Heybutzki, Helmut; Krug, Wolfgang; and Seferiadis, Johann, 4,418,544., Cl. 62-55.000.

Kerpel-Fronius, Sandor: *See*—
Elekes, Ilona; Institoris, Laszlo; Medzihradsz, Kalman; Otvos, Laszlo; Medzihradszky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522., Cl. 549-557.000.

Kerr, Richard K.: *See*—
Jagodzinski, Richard F.; and Kerr, Richard K., 4,419,337., Cl. 423-574.00R.

Kessler, Gerald. Extruded fin-type weatherstrip. 4,419,315., Cl. 264-145.000.

Ketchledge, Raymond W., to Bell Telephone Laboratories, Incorporated. Reactance meter. 4,419,623., Cl. 324-57.00Q.

Keuffel & Esser Company: *See*—
Pillitteri, Noreen J., 4,419,432., Cl. 430-179.000.

Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, to Richter Gedeon Vegyeszeti Gyar RT. Nitro-substituted polycyclic derivatives useful in the treatment of psoriasis. 4,419,359., Cl. 424-256.000.

Kibby, Robert M., to Reynolds Metals Company. Aluminum purification system. 4,419,126., Cl. 75-10.00R.

Kienzle, Uwe: *See*—
Boning, Bernward; Nagel, Rudolf; Honig, Gunter; Kienzle, Uwe; and Theuerkauf, Heinz, 4,418,567., Cl. 73-35.000.

Kiendl, Helmut: *See*—
Roth, Martin; and Kiendl, Helmut, 4,419,033., Cl. 410-32.000.

Kikuchi, Hideo, to Fujitsu Limited. Power on clear circuit. 4,419,596., Cl. 307-603.000.

Killgoar, Paul C., Jr.: *See*—
Tabar, Ronald J.; and Killgoar, Paul C., Jr., 4,419,480., Cl. 524-525.000.

Killop, James T., to Anderson-Cook, Inc. Burnishing toothed power transmission members. 4,418,454., Cl. 29-90.00B.

Kilpper, Gerhard; and Grimmer, Johannes, to BASF Aktiengesellschaft. Continuous preparation of phthalimide. 4,419,519., Cl. 548-480.000.

Kim, Chang J.: *See*—
Grenoble, Dane C.; Kim, Chang J.; and Murrell, Lawrence L., 4,419,222., Cl. 208-120.000.

Kim, Daiuk: *See*—
Sin, Yoon K.; and Kim, Daiuk, 4,419,274., Cl. 502-304.000.

Kim, Jaime S. Piano pedal extension. 4,418,604., Cl. 84-232.000.

Kim, Ki-Hwan; Yoo, Kwang-Keun; and Lee, Tae-Ho, to Office of Monopoly. Method for expanding tobacco and apparatus therefor. 4,418,706., Cl. 131-296.000.

Kim, Syng N., to Wilco Corporation. Illuminated push-button switch assembly. 4,419,555., Cl. 200-314.000.

Kimbrell, Melvin, Sr., deceased (by Kimbrell, Melvin D., Jr., executor), to Georgia-Pacific Corporation. Produce tray with reinforced corner construction. 4,418,863., Cl. 229-49.000.

Kimbrell, Melvin D., Jr., executor: *See*—
Kimbrell, Melvin, Sr., deceased, 4,418,863., Cl. 229-49.000.

Kimura, Kenji, to Olympus Optical Company Limited. Apparatus for driving objective lens in tracking direction. 4,419,614., Cl. 318-653.000.

Kinanen, Ilmari, to Instrumentarium Oy. Slit collimator in a panoramic X-ray apparatus. 4,419,764., Cl. 378-153.000.

Kinberg, Benjamin. Action game. 4,418,908., Cl. 273-1.0GE.

Kinetic Systems, Inc.: *See—*
Wyatt, Richard J., 4,419,345., Cl. 424-153.000.

Kingsley, William, to Xerox Corporation. Multi-mode document handling system. 4,419,007., Cl. 355-14.0SH.

Kinoshita, Takao: *See—*
Kawabata, Takashi; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,419,574., Cl. 250-204.000.

Kiraly, Arpad: *See—*
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.

Kiraly nee Soos, Gyongyver: *See—*
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.

Kiritani, Takeshi: *See—*
Ishijima, Shizuo; Kiritani, Takeshi; and Hayashi, Yukio, 4,419,134., Cl. 106-87.000.

Kirshman, Samson, to Applied Materials, Inc. Wafer tray construction. 4,419,076., Cl. 432-253.000.

Kirst, Herbert A.: *See—*
Baltz, Richard H.; Kirst, Herbert A.; Wild, Gene M.; and Seno, Eugene T., 4,419,508., Cl. 536-7.100.

Kishi, Hiroyasu; Sakamoto, Junji; and Kondou, Sadao, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Pulsive noise removing apparatus. 4,419,541., Cl. 381-7.000.

Kistner, Heinz: *See—*
Becker, Werner; Kistner, Heinz; and Schrotz, Kurt, 4,419,171., Cl. 156-384.000.

Kitada, Ritsuo: *See—*
Ueshima, Michio; Takahashi, Yoshiyuki; Kitada, Ritsuo; and Nagai, Isao, 4,419,270., Cl. 502-209.000.

Kitahara, Makoto: *See—*
Katagiri, Kazuharu; Ishikawa, Shozo; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,419,428., Cl. 430-77.000.

Kitahiro, Isamu: *See—*
Ogawa, Kazufumi; and Kitahiro, Isamu, 4,419,425., Cl. 430-7.000.

Kitakaze, Seiji: *See—*
Tsuzurabara, Mamoru; and Kitakaze, Seiji, 4,419,606., Cl. 315-39.510.

Kitamura, Atsushi: *See—*
Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, 4,419,389., Cl. 427-294.000.

Kitasato Institute, The: *See—*
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Sano, Yoshimoto; Shibukawa, Nobuyuki; and Hashimoto, Takashi, 4,419,349., Cl. 424-195.000.

Kleczkowski, Peter S.: *See—*
Radman, Anton J.; Bauck, Randall C.; and Kleczkowski, Peter S., 4,419,704., Cl. 360-102.000.

Kleemann, Axel: *See—*
Wolfgang, Bergstein; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,419,272., Cl. 502-84.000.

Klein, Gerhard: *See—*
Arlt, Dieter; and Klein, Gerhard, 4,419,297., Cl. 260-465.200.

Klemm, Dieter; and Ulith, Peter, to Voith GmbH. Method of operation of a pump-turbine between part-load operation and reverse pumping operation. 4,419,047., Cl. 415-150.000.

Klinkowski, Peter R., to Dorr-Oliver Incorporated. Solid polymeric electrolyte. 4,419,209., Cl. 204-296.000.

Klish, William J.: *See—*
Nichols, Buford L., Jr.; Klish, William J.; and Potts, Vivian E., 4,419,369., Cl. 426-2.000.

Klumpp, Walter, to Rheinmetall GmbH. Arrangement for pre-selecting the cadence of firing bursts of a pressurized gas loader of a gun. 4,418,608., Cl. 89-193.000.

Klynas, Scott S., to Mattel, Inc. Electronic percussion synthesizer. 4,418,598., Cl. 84-1.030.

Kniege, Wilfried: *See—*
Ackermann, Jurgen; Moretto, Hans-Heinrich; Kniege, Wilfried; and Rauer, Werner, 4,419,474., Cl. 524-195.000.

Knight, Alan. Wedge with flanges. 4,418,890., Cl. 254-104.000.

Knights, John C., to Xerox Corporation. Glow discharge apparatus with squirrel cage electrode. 4,418,645., Cl. 118-715.000.

Knoblauch, Rainer: *See—*
Dietzsch, Kurt; and Knoblauch, Rainer, 4,418,743., Cl. 165-12.000.

Knodler, Reinhard; Harbach, Friedrich; and Weiler, Ludwig, to Brown, Boveri & Cie AG. Individual rechargeable electric cell. 4,419,418., Cl. 429-104.000.

Knodler, Reinhold, to Brown, Boveri & Cie AG. Rechargeable electric storage battery. 4,419,419., Cl. 429-104.000.

Knoll, Gunther: *See—*
Esper, Friedrich; Frey, Thomas; Geier, Heinz; Holfelder, Gerhard; and Knoll, Gunther, 4,418,661., Cl. 123-145.00A.

Knollman, Dieter J. H.: *See—*
Embree, Milton L.; Knollman, Dieter J. H.; and Martin, Earl O., 4,419,542., Cl. 179-77.000.

Knufelmann, Manfred: *See—*
Brandner, Burkhard; Knufelmann, Manfred; and Blauhut, Reinhold, 4,418,668., Cl. 123-416.000.

Kobayashi, Hiroaki: *See—*
Torii, Michihiro; and Kobayashi, Hiroaki, 4,418,471., Cl. 29-596.000.

Kobayashi, Shin-ichiro: *See—*
Imai, Kazuhiro; Tamura, Zenzo; and Kobayashi, Shin-ichiro, 4,419,452., Cl. 436-89.000.

Kobayashi, Toshio: *See—*
Nate, Kazuo; Kobayashi, Toshio; and Isogai, Tokio, 4,419,506., Cl. 526-316.000.

Kober, Kasimir, to Chicago Dryer Company. Heated smoothing roll. 4,418,486., Cl. 38-58.000.

Koch, Earl E.; Gamber, A. Dale; and Ehrhart, Philip J., to Sperry Corporation. Mechanism for spring loading a transport lock. 4,418,518., Cl. 56-228.000.

Koch, Robert C.: *See—*
Davis, James A.; and Koch, Robert C., 4,419,470., Cl. 524-76.000.

Koch, Ulf, to Esselte Pendeflex Corporation. Stepped-down mechanical counting mechanism. 4,419,571., Cl. 235-1.00C.

Kochackis, Donald G. Vending machine security cage. 4,418,551., Cl. 70-18.000.

Kogawa, Kouichi: *See—*
Kawasaki, Teruo; Kogawa, Kouichi; and Nomura, Hiroyuki, 4,419,611., Cl. 318-443.000.

Kogure, Yoichiro: *See—*
Wakamatsu, Hidekazu; and Kogure, Yoichiro, 4,418,539., Cl. 60-646.000.

Kohara, Koujirou; and Miyano, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing heat-insulating member and device therefor. 4,419,307., Cl. 264-46.500.

Kohashi, Tadao, to Matsushita Electric Industrial Co., Ltd. Display device. 4,419,663., Cl. 340-783.000.

Kohira, Takeo: *See—*
Etoh, Kuniomi; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, 4,419,438., Cl. 430-275.000.

Koistinen, Arnold A., to Dakota Plastics Company. Support structure for small floral arrangement. 4,418,496., Cl. 47-41.120.

Kojima, Takuhito; Satake, Yasuo; and Masuda, Toru, to Fujitsu Limited. Network connection system. 4,419,753., Cl. 370-62.000.

Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Sano, Yoshimoto; Shibukawa, Nobuyuki; and Hashimoto, Takashi, to Kitasato Institute, The. Interferon inducer, a process for producing the same and pharmaceutical composition containing the same. 4,419,349., Cl. 424-195.000.

Kokusan Kinzoku Kogyo Co., Ltd.: *See—*
Shimizu, Keiichi; and Mochida, Haruo, 4,419,712., Cl. 361-172.000.

Kolesnik, Anatoly G.; Kadnikova, Galina I.; Morozova, Lilia V.; and Boginskaya, Lidia M., to Rizhsky Meditsinsky Institut. Drug for treatment of dental caries. 4,419,341., Cl. 424-52.000.

Kolobow, Theodor; and Ito, Yoichiro, to United States of America, Health and Human Services. Blood cell separator. 4,419,089., Cl. 494-45.000.

Kolonia, Robert A. Hand tool and a core reinforced molded synthetic material handle therefor. 4,418,732., Cl. 145-2.00R.

Kolta, Rezso: *See—*
Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezso; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, 4,419,524., Cl. 562-506.000.

Komorek, Julius: *See—*
Downs, Edward T., Jr.; and Komorek, Julius, 4,418,719., Cl. 137-625.310.

Kondou, Sadao: *See—*
Kishi, Hiroyasu; Sakamoto, Junji; and Kondou, Sadao, 4,419,541., Cl. 381-7.000.

Kondow, Ryotaro: *See—*
Yamaura, Mitsuru; Kondow, Ryotaro; Inagaki, Junichi; and Matsuzawa, Kunio, 4,419,737., Cl. 364-900.000.

Koni, Tsuyoshi; and Urushida, Yoshihisa, to Citizen Watch Co., Ltd. Flow restrictor. 4,418,723., Cl. 138-42.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Nakamura, Tadashi; and Hara, Haruo, 4,419,009., Cl. 355-103.000.

Konno, Seishi: *See—*
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Sano, Yoshimoto; Shibukawa, Nobuyuki; and Hashimoto, Takashi, 4,419,349., Cl. 424-195.000.

Kontz, Robert F., to Owens-Illinois, Inc. Automatic cup dispensing apparatus. 4,418,837., Cl. 221-222.000.

Koo, Stephen. Vapor proof housing assembly and system. 4,419,716., Cl. 362-96.000.

Koppers Company, Inc.: *See—*
Hyde, Jack, 4,419,075., Cl. 432-217.000.

Korbuly, Jozsef: *See—*
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715., Cl. 137-508.000.

Kornatowski, Boleslaw, to Singer Company, The. Combination handwheel and handwheel clutch for sewing machines. 4,418,809., Cl. 192-67.00R.

Kosaka, Shuhei; and Fujii, Toshihiro, to Toshiba Silicones Limited. Method of protecting silver contacts. 4,419,254., Cl. 252-37.000.

Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, to Egyt Gyogyszervegyeszeti Gyar. Condensed as-triazine derivatives and method of using the same. 4,419,355., Cl. 424-249.000.

Kozponti Banyaszati Fejlesztesi Intezet: *See*—
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715., Cl. 137-508.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Fricker, Wolfgang-Peter; and Scholz, Manfred, 4,418,724., Cl. 138-149.000.

Kramer, Kenneth D.; Stoss, Kenneth J.; and Sparks, Gregory E., to Deere & Company. Solenoid with saturable element. 4,419,642., Cl. 335-227.000.

Kramer, Morton: *See*—
Borman, Willem F. H.; Kramer, Morton; and Reilly, Eugene P., 4,419,485., Cl. 525-437.000.

Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, ans, to Bayer Aktiengesellschaft. Combating fungi with 1-phenoxy -1-imidazol-1-yl-4-fluoro-butane derivatives. 4,419,361., Cl. 424-273.00R.

Kranser, Leonard S. Photosensitive plate. 4,419,436., Cl. 430-260.000.

Krasucki, Joseph F., Jr.: *See*—
Branigin, Michael H.; Sherbert, Edward G.; and Krasucki, Joseph F., Jr., 4,419,724., Cl. 364-200.000.

Krause, Bernd, to Xomox Corporation. Fire safe seat for a valve. 4,418,889., Cl. 251-306.000.

Krautkremer, Franz; and Isaleib, Juergen, to Schottel-Werft, Josef Becker GmbH & Co. KG. Apparatus for controlling a watercraft. 4,418,633., Cl. 114-144.00E.

Krautkremer, Franz; and Lais, Siegfried, to Schottel-Werft Josef Becker GmbH & Co KG. Water-jet drive mechanism for driving and controlling of particularly shallow-draught watercrafts. 4,419,082., Cl. 440-42.000.

Kress, Kenneth A., to United States of America, America. Solid state neutron detector. 4,419,578., Cl. 250-390.000.

Kretz, Rolf H., to Process Engineering Company SA. Continuous fermentation in series of main vessels with auxiliary vessel provided. 4,419,448., Cl. 435-161.000.

Krieder, Robert D., to Bendix Corporation, The. Automatic speed control for heavy vehicles. 4,419,729., Cl. 364-426.000.

Krishna, Rajamani: *See*—
Voetter, Heinz; Van Meurs, Hubrecht C. A.; Darton, Richard C.; and Krishna, Rajamani, 4,419,215., Cl. 208-11.00R.

Kroha, Walter: *See*—
Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, 4,419,440., Cl. 430-377.000.

Kropp, Lev. Inertial conveyor. 4,418,816., Cl. 198-773.000.

Kroy Inc.: *See*—
Bradshaw, Franklin C.; and Connoy, Thomas P., 4,419,175., Cl. 156-554.000.

Krug, Wolfgang: *See*—
Heybutzki, Helmut; Krug, Wolfgang; and Seferiadis, Johann, 4,418,544., Cl. 62-55.000.

Krusemark, Kenneth J.; and Stackhouse, James L., Jr., to Emerson Electric Co. Anti-kickback device. 4,418,597., Cl. 83-478.000.

Krutchen, Charles M., to Mobil Oil Corporation. Polystyrene foam extrusion into a foam assisting atmosphere. 4,419,309., Cl. 264-53.000.

Krzanowski, James E.: *See*—
Ainslie, Norman G.; Krzanowski, James E.; and Palmateer, Paul H., 4,418,857., Cl. 228-124.000.

Kubbota, Massashi; and Noda, Touru, to Mitsubishi Paper Mills, Ltd. Photographic material. 4,419,433., Cl. 430-206.000.

Kubota Ltd.: *See*—
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,419,129., Cl. 420-584.000.
Teraoka, Akira; and Nakamura, Tadashi, 4,418,783., Cl. 180-209.000.

Kubota, Yuichi: *See*—
Isobe, Yukihiro; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, 4,419,406., Cl. 428-422.000.

Kuboto, Ltd.: *See*—
Fujimoto, Tsutomu, 4,418,758., Cl. 172-7.000.

Kuehnle, Manfred R., to Coulter Systems Corporation. Method and apparatus for making transparencies electrostatically. 4,419,004., Cl. 355-3.0TR.

Kuehnle, Manfred R., to Coulter Systems Corporation. Imaging method and apparatus. 4,419,005., Cl. 355-3.0TR.

Kuhl, Gunter H.: *See*—
Angevine, Philip J.; Kuhl, Gunter H.; and Mizrahi, Sadi, 4,419,218., Cl. 208-59.000.

Kuhl, Walter H.; Van Leunen, Johannes A. J.; van der Eijk, Bart; van der Bolt, Antonius J. J. M.; and Hoeberechts, Arthur M. E., to U.S. Philips Corporation. X-Ray detector. 4,418,452., Cl. 445-35.000.

Kuhnel, Frank, to VDO Adolf Schindling AG. Device for the capacitive measurement of the filling level of fluid to a container. 4,418,569., Cl. 73-304.00C.

Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, to VEB Filmfabrik Wolfen. Process for the introduction of hydrophobic photographic additives. 4,419,440., Cl. 430-377.000.

Kuindersma, Pieter I., to U.S. Philips Corporation. Electret transducer. 4,419,545., Cl. 179-111.00E.

Kukes, Simon G.; and Davis, Thomas, to Phillips Petroleum Company. Demetallization of heavy oils. 4,419,225., Cl. 208-251.00R.

Kulite Semiconductor Products: *See*—
Kurtz, Anthony D.; and Weinstein, Donald, 4,419,620., Cl. 323-280.000.

Kunkel, Arden L., to Weyerhaeuser Company. Cleaning labyrinthine system with foamed solvent and pulsed gas. 4,419,141., Cl. 134-22.120.

Kuriakose, Areekattuthazhayil K., to Norton Company. Silicon carbide production and furnace. 4,419,336., Cl. 423-345.000.

Kuroyanagi, Makoto: *See*—
Iwamoto, Kenzi; and Kuroyanagi, Makoto, 4,418,537., Cl. 60-611.000.

Kurtin, Stephen: *See*—
Kelm, Edward C.; and Kurtin, Stephen, 4,419,543., Cl. 179-81.00R.

Kurtz, Anthony D.; and Weinstein, Donald, to Kulite Semiconductor Products. Linearizing circuits for a semiconductor pressure transducer. 4,419,620., Cl. 323-280.000.

Kuse, Kazumasa: *See*—
Atsumi, Tomiaki; Kuse, Kazumasa; and Deto, Junji, 4,418,898., Cl. 267-63.00R.

Kushi, Kenji: *See*—
Nakashima, Atushi; Edamatu, Michisuke; and Kushi, Kenji, 4,418,641., Cl. 118-429.000.

Kushida, Machiro; Takasugi, Tsuneji; and Irie, Kenji, to Citizen Watch Co. Ltd. Bicolored polyhedral body of aluminum. 4,419,409., Cl. 428-469.000.

Kusumoto, Katsunori: *See*—
Yoshimi, Kazuhiko; Shimizu, Kazuyuki; Watari, Takashi; and Kusumoto, Katsunori, 4,418,632., Cl. 114-102.000.

Kuwazima, Shigeru; Kato, Eiichi; and Yamada, Minoru, to Fuji Photo Film Co., Ltd. Process for forming photographic images. 4,419,439., Cl. 430-375.000.

Kuze, Yoshikazu. Sequence control system. 4,419,761., Cl. 377-16.000.

Kwiatkowski, Joachim: *See*—
Eggert, Albert; Gahleitner, Erwin; and Kwiatkowski, Joachim, 4,418,787., Cl. 181-130.000.

Kwoka, David: *See*—
Faucher, Joseph E.; Wright, Richard R.; Pane, Francis C., Jr.; Kwoka, David; and Striebel, Edmund E., 4,418,543., Cl. 60-742.000.

Kyllonen, Allen W.: *See*—
Hart, James E.; Spalding, Willard P.; and Kyllonen, Allen W., 4,418,799., Cl. 188-153.00R.

Kyono, Tetsuyuki: *See*—
Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, 4,419,389., Cl. 427-294.000.

L. D. Schreiber Cheese Co., Inc.: *See*—
Streeter, Robert R.; Whitehorn, Vincent J.; and Nicholas, Earl C., 4,418,616., Cl. 99-458.000.

La Gard, Inc.: *See*—
Uyeda, Tim M., 4,418,555., Cl. 70-366.000.

La Telemecanique Electrique: *See*—
Bejot, Emile; and Filiaggi, Adriano, 4,419,625., Cl. 324-142.000.

Laboratorios Serobiologiques S.A.: *See*—
Pauly, Marc, 4,419,343., Cl. 424-59.000.

Labude, Wolfgang: *See*—
Bauer, Karl-Heinz; Eckert, Gerold; and Labude, Wolfgang, 4,419,639., Cl. 334-7.000.

LaForce, Jean, to Stringer, Carl; Stringer Oil and Gas Company, Inc.; and Stringer, Carl T. Clamping method and apparatus for solid phase welding. 4,418,860., Cl. 228-196.000.

Lahrs, Jurgen: *See*—
Henning, Hans-Joachim; Lahrs, Jurgen; and Liebsch, Dietrich, 4,419,295., Cl. 260-453.0PH.

Lais, Siegfried: *See*—
Krautkremer, Franz; and Lais, Siegfried, 4,419,082., Cl. 440-42.000.

Lakatos, Edward J.; and Talmadge, Faul C., to Perkin-Elmer Corporation, The. Apparatus useful for positioning a light filter. 4,419,575., Cl. 250-226.000.

Lakin, David F., to Lucas Industries Limited. Fuel injection pumping apparatus. 4,418,670., Cl. 123-446.000.

Lamarche, Dominique; and Soster, Marie C., to SOCAPEX. Tool unit for collective breaking of optical fibres. 4,418,855., Cl. 225-96.000.

Lambot, Honore J., to Societe Anonyme Diamant Boart. Process for retrieving a coring barrel comprising two tubes and retrieving device for such a process. 4,418,770., Cl. 175-58.000.

Lambregts, Antonius A.; and Hansen, Rolf, to Boeing Company, The. Method and apparatus for an aircraft inner loop elevator control system. 4,419,732., Cl. 364-428.000.

Lancaster, Patrick R., III; and Lancaster, William G., to Lantech, Inc. Stretch wrapping apparatus and process. 4,418,510., Cl. 53-399.000.

Lancaster, William G.: *See*—
Lancaster, Patrick R., III; and Lancaster, William G., 4,418,510., Cl. 53-399.000.

Landa, Benzion, to Savin Corporation. Large capacity combination magazine and sheet feeder for copying machines. 4,418,903., Cl. 271-10.000.

Landis, H. Richard, to Landis Plastics Inc. Large volume container with gasketless seal. 4,418,833., Cl. 220-306.000.

Landis Plastics Inc.: *See*—
Landis, H. Richard, 4,418,833., Cl. 220-306.000.

Lang, Josef; Hollaus, Reinhard; Reeh, Ulrike; Denk, Hans; and Habrich, Reiner, to Siemens Aktiengesellschaft. Photo-voltaic solar module. 4,419,531., Cl. 136-251.000.

Lang, Stanley A., Jr.: *See*—
Child, Ralph G.; and Lang, Stanley A., Jr., 4,419,354., Cl. 424-248.560.

Langenhorst, Christoph: *See*—
Langenhorst, Gunter; and Langenhorst, Christoph, 4,418,746., Cl. 165-76.000.

Langenhorst, Gunter; and Langenhorst, Christoph, to Top-Element Bauelemente fur Innenausbau and Raumgestaltung GmbH & Co. KG. Plate-type heat-exchanger and manifold assembly. 4,418,746., Cl. 165-76.000.

Lantech, Inc.: *See*—
Lancaster, Patrick R., III; and Lancaster, William G., 4,418,510., Cl. 53-399.000.

Lanthier, Joseph D.: *See*—
Josef, Michael J.; and Lanthier, Joseph D., 4,418,726., Cl. 139-383.00A.

LaPierre, Rene B.; Partridge, Randall D.; Chen, Nai Y.; and Wong, Steven S., to Mobil Oil Corporation. Catalytic dewaxing process. 4,419,220., Cl. 208-111.000.

Larsen, Paul S.: *See*—
Conde, James C.; and Larsen, Paul S., 4,418,742., Cl. 165-8.000.

Larson, Allen L., to Bell Telephone Laboratories, Incorporated. Channel interface circuit providing virtual channel number translation and direct memory access. 4,419,728., Cl. 364-200.000.

Larson, Roger R., to I-Temp Corporation. Method of assembling a filter holder. 4,419,166., Cl. 156-272.400.

Laser Photonics, Inc.: *See*—
Bellar, Dennis; and Sasser, Thurman, 4,418,996., Cl. 353-33.000.

Laserscope, Inc.: *See*—
Loeb, Marvin P., 4,418,688., Cl. 128-6.000.

Lassiter, Will M. Drain shield for gutters. 4,418,504., Cl. 52-12.000.

Laucks, Rudolf; and Blickle, Karl, to J. M. Voith GmbH. Amphibious vehicle. 4,419,085., Cl. 440-93.000.

LaValley Industrial Plastics, Inc.: *See*—
LaValley, Richard W., 4,419,165., Cl. 156-245.000.

LaValley, Richard W., to LaValley Industrial Plastics, Inc. Method of making a rotary drum filter and method of making an annular valve housing for such a drum filter. 4,419,165., Cl. 156-245.000.

Law, Derek A.: *See*—
Shim, Joosup; and Law, Derek A., 4,419,251., Cl. 252-32.70E.

Law, Ming-Fan: *See*—
Howley, Peter M.; Sarver, Nava; and Law, Ming-Fan, 4,419,446., Cl. 435-68.000.

Leach, John G., to General Electric Company. High voltage current limiting fuse having a fuse element susceptible to oxidation and especially suited for high operating temperatures. 4,419,651., Cl. 337-159.000.

Lech, Thaddeus, Jr., to Borg-Warner Corporation. Clutch driven plate assembly with a floating hub. 4,418,812., Cl. 192-106.200.

Leco Corporation: *See*—
Sitek, George J; and Bredeweg, Roger L., 4,419,754., Cl. 373-118.000.

Le Craw, Roy C.; Luther, Lars C.; and Nelson, Terence J., to Bell Telephone Laboratories, Incorporated. Magnetic domain device having a wide operational temperature range. 4,419,417., Cl. 428-692.000.

Lectron Products, Inc.: *See*—
Slavin, Michael; and Miller, Ellsworth S., 4,419,641., Cl. 335-219.000.

Lee, Gilbert F.: *See*—
Madigosky, Walter M.; and Lee, Gilbert F., 4,418,573., Cl. 73-574.000.

Lee, Kenneth R.: *See*—
Cedrone, Nicholas J.; and Lee, Kenneth R., 4,419,626., Cl. 324-158.00P.

Lee, Kyu-Wang: *See*—
Piccirilli, Robert M.; Chang, Wen-Hsuan; Porter, Samuel, Jr.; O'Dwyer, James B.; and Lee, Kyu-Wang, 4,419,407., Cl. 428-423.100.

Lee, Lawrence L., to Magnavox Government and Industrial Electronics Company. Method for individually encapsulating magnetic particles. 4,419,383., Cl. 427-47.000.

Lee, Richard J. Powder measuring device for cartridge reloader. 4,418,606., Cl. 86-31.000.

Lee, Tae-Ho: *See*—
Kim, Ki-Hwan; Yoo, Kwang-Keun; and Lee, Tae-Ho, 4,418,706., Cl. 131-296.000.

Leeds & Northrup Company: *See*—
Ross, Charles W., 4,419,733., Cl. 364-493.000.

Leep, Oral F.; Dellinger, Vernon D.; and Bauer, Claude J., to GTE Products Corporation. Electrical wiring box arrangements. 4,419,537., Cl. 174-65.00R.

Leeper, Harold M.; Baumrind, Nikki; and Peery, John R., to ALZA Corporation. Elastomeric bladder assembly. 4,419,096., Cl. 604-132.000.

Leger, Violeta Z.; and Evans, William P., to Union Carbide Corporation. Sulfide-containing cathode for nonaqueous cells. 4,419,422., Cl. 429-194.000.

Leger, Violeta Z., to Union Carbide Corporation. Nonaqueous cells employing heat-treated MnO_2 cathodes and a PC-DME-$LiCF_3SO_3$ electrolyte. 4,419,423., Cl. 429-197.000.

Lein, George M., Jr.: *See*—
Barrett, James H.; Howell, Thomas J.; and Lein, George M., Jr., 4,419,245., Cl. 210-681.000.

Leinenger, John T., to Modular Automation, Inc. Modular open chuting. 4,418,813., Cl. 193-35.00J.

Leithauser, Horst: *See*—
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,419,458., Cl. 521-56.000.

Lemaire, Paul, to Filature Saint Andre. Notched roller for producing fancy yarns in spinning-twisting machines. 4,418,523., Cl. 57-207.000.

Lennon, Robert D., to Standex International Corporation. Multiple position half-turn inductor. 4,419,645., Cl. 336-65.000.

Lenzini, Albert A.; Swanson, Robert C.; Roberts, James T.; and Pruski, John A., to Teletype Corporation. Retaining clip for an electrical connector. 4,418,976., Cl. 339-91.00R.

Le Poole, Jan B.: *See*—
Frima, Heico J.; and Le Poole, Jan B., 4,419,561., Cl. 219-121.0EB.

Leroux, Jean E., to Poclain. Endless track drive device. 4,418,775., Cl. 180-9.620.

Les Modeles Francais: *See*—
Goiset, Jean-Pierre, 4,419,588., Cl. 307-9.000.

Leslie Metal Arts Company: *See*—
Hyder, Marvin W.; and Weinstock, Steven F., 4,418,970., Cl. 312-305.000.

Lesly, Michel; and Spector, George. Window-door alarm. 4,418,638., Cl. 116-87.000.

Letchworth, Peter E.; and Williamson, Thomas B., to Stauffer Chemical Company. Carbofuran compositions for problem soils. 4,419,350., Cl. 424-225.000.

Leto, Alfonso. Internal locking device for telescopic elements and method of making the same. 4,419,026., Cl. 403-104.000.

Leung, Chun K.: *See*—
Johnson, Edwin A.; and Leung, Chun K., 4,418,669., Cl. 123-436.000.

LeVeen, Eric G.; LeVeen, Robert F.; and Rubricius, Jeanette L. Vein and tubing passer surgical instrument. 4,418,693., Cl. 128-303.00R.

LeVeen, Robert F.: *See*—
LeVeen, Eric G.; LeVeen, Robert F.; and Rubricius, Jeanette L., 4,418,693., Cl. 128-303.00R.

Levine, Stephen A.: *See*—
Kaufman, Benjamin J.; Sawicki, Robert A.; and Levine, Stephen A., 4,419,255., Cl. 252-51.50A.

Levinson, Solomon, to Centre Engineering, Inc. Multiple electrode series capacitor. 4,419,713., Cl. 361-321.000.

Levinstein, Hyman J.; and Vratny, Frederick, to Bell Telephone Laboratories, Incorporated. Apparatus and method for plasma-assisted etching of wafers. 4,419,201., Cl. 204-192.00E.

Lew, Hyok S.; and Chapman, Ronald R. Elastic coupling for pipes and tubes. 4,418,948., Cl. 285-420.000.

Lewis, Paul J. S.: *See*—
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., 4,419,243., Cl. 210-618.000.

Leyrer, Reinhold J.: *See*—
Graser, Fritz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,419,427., Cl. 430-58.000.

Li, Norman N.: *See*—
Hsu, Edward C.; Li, Norman N.; and Hucal, Taras, 4,419,200., Cl. 204-186.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
von der Ropp, Hubert, 4,419,332., Cl. 422-245.000.

Liddiard, Roy, to General Signal Corporation. Agitator having detachable wear sleeve. 4,419,015., Cl. 366-349.000.

Liebsch, Dietrich: *See*—
Henning, Hans-Joachim; Lahrs, Jurgen; and Liebsch, Dietrich, 4,419,295., Cl. 260-453.0PH.

Liefkens, Adrianus C. H. J.; and Notenboom, Gerardus J. A. M., to U.S. Philips Corporation. Magnetic head comprising two spot welded metal plates. 4,419,415., Cl. 428-594.000.

Lightner, Donald V., to Marine Culture Enterprises. Process for the reduction of gill disease in shrimp. 4,418,648., Cl. 119-2.000.

Liles, Donald T.: *See*—
Speier, John L.; and Liles, Donald T., 4,419,060., Cl. 425-8.000.

Lindeman (Holdings) Limited: *See*—
Shaw, Philip L., 4,419,238., Cl. 210-338.000.

Linder, Ernst: *See*—
Muller, Klaus; Rieger, Franz; and Linder, Ernst, 4,418,672., Cl. 123-478.000.

Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezso; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt. Process for the preparation of dihalovinylcyclopropanecarboxylic acids. 4,419,524., Cl. 562-506.000.

Line Fast Corporation: *See*—
DiMartino, John M., 4,419,034., Cl. 410-83.000.

Lipton, Lenny, to Stereographics Corp. Stereoscopic zoom lens system for three-dimensional motion pictures and television. 4,418,993., Cl. 352-57.000.

Lischewski, Regina, geb. Werndl; Marx, Jorg; Walter, Reinhard; and Mockel, Peter, to VEB Filmfabrik Wolfen. One- or two-component diazo-type material with diphenyl diamine as light fade inhibitor. 4,419,431., Cl. 430-179.000.

Liss, Warren A., to Bell Telephone Laboratories, Incorporated. Electrical keying arrangement. 4,418,971., Cl. 339-17.00L.

Loane, Charles M., Jr., to Mobay Chemical Corporation. Flux for continuous casting. 4,419,131., Cl. 75-257.000.

Locke, Charles H., to International Business Machines Corporation. Low inductance ceramic capacitor and method for its making. 4,419,714., Cl. 361-321.000.

Lockheed Corporation: *See*—
Blad, Leiv H., 4,419,170., Cl. 156-361.000.
Weber, Kenneth E.; and Hoffer, Steven D., 4,419,191., Cl. 204-1.00T.

Loeb, Marvin P., to Laserscope, Inc. Microcatheter having directable laser and expandable walls. 4,418,688., Cl. 128-6.000.

Loeffler, Hermann: *See*—
Dehnert, Johannes; and Loeffler, Hermann, 4,419,290., Cl. 260-186.000.
Loftus, James J.: *See*—
Cuneo, Andrew A., Jr.; and Loftus, James J., 4,419,622., Cl. 324-57.00R.
Loggers, Hendrik; and Versteeg, Gijsbert, to Aarding Weerstandslas B.V. Method for making granular hydrothermally hardened material. 4,419,312., Cl. 264-82.000.
Long, Robert B.; and Caruso, Fred A., to Exxon Research and Engineering Co. Adsorption of basic asphaltenes on solid acid catalysts. 4,419,219., Cl. 208-86.000.
Long, William G.; and Moeller, Helen H., to Babcock & Wilcox Company, The. Rapid-fire refractories. 4,419,454., Cl. 501-95.000.
Loomis, Richard E., to Delron Research and Development Corporation. Building insulation composition. 4,419,256., Cl. 252-62.000.
Lopata, Ira: *See*—
Barto, Robert M., Jr.; and Lopata, Ira, 4,418,643., Cl. 118-657.000.
L'Oreal: *See*—
Bugaut, Andree; and Cotteret, Jean, 4,419,101., Cl. 8-415.000.
Lorenze, Robert V., Jr., to Xerox Corporation. Method of delineating thin film magnetic head arrays. 4,418,472., Cl. 29-603.000.
Lorincz, Csaba: *See*—
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.
Losee, Paul D.: *See*—
Brower, Ralph D.; and Losee, Paul D., 4,419,705., Cl. 360-103.000.
Lotter, Kurt: *See*—
Schulze, Carsten; Lotter, Kurt; and Malefakis, Jakob, 4,418,708., Cl. 137-15.200.
Loup, Ronald L.: *See*—
Day, Curtis H.; and Loup, Ronald L., 4,418,720., Cl. 137-625.650.
Lubrizol Corporation, The: *See*—
Hopkins, Thomas R., 4,419,466., Cl. 523-324.000.
Lucas Industries Limited: *See*—
Dufft, Jurgen, 4,418,534., Cl. 60-585.000.
Hess, Wolfgang, 4,418,800., Cl. 188-195.000.
Joby, Michael J., 4,418,529., Cl. 60-39.281.
Lakin, David F., 4,418,670., Cl. 123-446.000.
Sosnowski, Stanislaw J. A.; and Skinnger, Robert T. J., 4,419,054., Cl. 417-294.000.
Lucas Industries plc: *See*—
Mowbray, Dorian F., 4,418,870., Cl. 239-533.800.
Lucas, Joseph P., to PPG Industries, Inc. Electrodepositable compositions. 4,419,468., Cl. 523-426.000.
Lucian, Anton, to Aktiengesellschaft Adolph Saurer. Weft thread-storage apparatus for a loom, especially a gripper loom. 4,418,728., Cl. 139-452.000.
Lue, Ping-Chang: *See*—
Ratkowski, Donald J.; and Lue, Ping-Chang, 4,419,505., Cl. 526-279.000.
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Miller, Robert C.: *See*—
Holtey, Thomas O.; and Miller, Robert C., 4,419,727., Cl. 364-200.000.
Miller, Roscoe E. Enema apparata improvements relating to double contrast studies. 4,419,099., Cl. 604-275.000.
Miller, Warren H., Jr., to Harris Corporation. Focus compensation linkage. 4,419,576., Cl. 250-234.000.
Milliken Research Corporation: *See*—
Crenshaw, Edward L., 4,418,451., Cl. 26-2.00R.
Mahaffey, Robert L., Jr., 4,419,473., Cl. 524-104.000.
Minolta Camera Kabushiki Kaisha: *See*—
Matsuda, Motonobu; and Tanaka, Yoshihiro, 4,419,011., Cl. 356-1.000.
Tominaga, Shinji; Imura, Toshinori; and Nakamura, Ikushi, 4,419,001., Cl. 354-173.100.
Yoshida, Fumio; Miki, Yukio; and Egawa, Takeshi, 4,419,000., Cl. 354-173.100.
Miskin, Leslie; and Flamm, Peter M., to ITT Industries, Inc. Color-television receiver with at least one digital integrated circuit for processing the composite color signal. 4,419,688., Cl. 358-27.000.
Missun, Heinz E. Offset indicator extension. 4,418,476., Cl. 33-172.00B.
Mistyurik, John D.: *See*—
Huggins, Orville C.; and Mistyurik, John D., 4,418,618., Cl. 101-68.000.
Mita Industrial Co., Ltd.: *See*—
Nakazawa, Toru, 4,419,429., Cl. 430-83.000.
Mitamura, Zenzou; Oosawa, Takashi; and Yonezawa, Akihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric lamp. 4,419,602., Cl. 313-332.000.
Mitco Corporation: *See*—
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., 4,418,788., Cl. 181-224.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Kato, Masaru, 4,419,551., Cl. 200-144.00B.
Ohshita, Masayuki; Horiuchi, Toshiaki; Yamanaka, Takashi; and Usui, Yoshihiro, 4,419,553., Cl. 200-144.00B.
Mitsubishi Paper Mills, Ltd.: *See*—
Fuchigami, Mitsuru; Ishiguro, Mamoru; and Ohye, Hideo, 4,418,941., Cl. 282-27.500.
Kubbota, Massashi; and Noda, Touru, 4,419,433., Cl. 430-206.000.
Mitsubishi Rayon Company, Ltd.: *See*—
Nakashima, Atushi; Edamatu, Michisuke; and Kushi, Kenji, 4,418,641., Cl. 118-429.000.
Yata, Yukio; and Inagaki, Koichi, 4,418,986., Cl. 350-128.000.
Miura, Eiji: *See*—
Katagiri, Masayoshi; Nomura, Yoshihisa; Kawaguchi, Hiroshi; Nishina, Shuho; and Miura, Eiji, 4,418,964., Cl. 303-6.00C.
Miyajiri, Tetsuo: *See*—
Nakahara, Motohiro; Yoshioka, Naoki; Yokota, Hiroshi; Miyajiri, Tetsuo; and Watanabe, Minoru, 4,419,116., Cl. 65-3.120.
Miyano, Susumu: *See*—
Kohara, Koujirou; and Miyano, Susumu, 4,419,307., Cl. 264-46.500.
Mizobe, Masatoshi, to Giken Kogyo Kabushiki Kaisha. Fluid impulse torque tool. 4,418,764., Cl. 173-12.000.
Mizrahi, Sadi: *See*—
Angevine, Philip J.; Kuhl, Gunter H.; and Mizrahi, Sadi, 4,419,218., Cl. 208-59.000.
Mizuno, Akinori: *See*—
Ebi, Yutaka; and Mizuno, Akinori, 4,419,673., Cl. 346-75.000.
Mizunuma, Tokuichi: *See*—
Momose, Shinroku; and Mizunuma, Tokuichi, 4,418,532., Cl. 60-316.000.
Mobay Chemical Corporation: *See*—
Hudson, George A., deceased; and Reiff, Helmut F., 4,419,293., Cl. 260-453.0AB.
Loane, Charles M., Jr., 4,419,131., Cl. 75-257.000.
Mobil Oil Corporation: *See*—
Angevine, Philip J.; Kuhl, Gunter H.; and Mizrahi, Sadi, 4,419,218., Cl. 208-59.000.
Audeh, Costandi A., 4,419,217., Cl. 208-11.00R.
Audeh, Costandi A., 4,419,456., Cl. 518-703.000.
Herrington, F. John, 4,419,087., Cl. 493-439.000.
Herrington, F. John, 4,419,159., Cl. 156-66.000.
Krutchen, Charles M., 4,419,309., Cl. 264-53.000.
LaPierre, Renz B.; Partridge, Randall D.; Chen, Nai Y.; and Wong, Steven S., 4,419,220., Cl. 208-111.000.
Park, Hee Chung P., 4,419,411., Cl. 428-516.000.

Shim, Joosup; and Law, Derek A., 4,419,251., Cl. 252-32.70E.
Shim, Joosup, 4,419,252., Cl. 252-32.70E.
Strom, E. Thomas; and Espenscheid, Wilton F., 4,418,961., Cl. 299-5.000.
Walsh, Dennis E., 4,419,328., Cl. 422-62.000.
Weiner, Milton L., 4,419,410., Cl. 428-516.000.

Mochida, Haruo: *See*—
Shimizu, Keiichi; and Mochida, Haruo, 4,419,712., Cl. 361-172.000.

Mochizuki, Masafumi: *See*—
Saito, Takashi; Tajima, Osamu; and Mochizuki, Masafumi, 4,419,709., Cl. 360-133.000.

Mockel, Peter: *See*—
Lischewski, Regina, geb. Werndl; Marx, Jorg; Walter, Reinhard; and Mockel, Peter, 4,419,431., Cl. 430-179.000.

Modisette, James E.; and Johnson, Ralph B., to Texas Medical Instruments, Inc. High speed infrared imaging system. 4,419,692., Cl. 358-113.000.

Modular Automation, Inc.: *See*—
Leinenger, John T., 4,418,813., Cl. 193-35.00J.

Moeller, Helen H.: *See*—
Long, William G.; and Moeller, Helen H., 4,419,454., Cl. 501-95.000.

Molaire, Michel F.; and Williams, John V., to Eastman Kodak Company. Image transfer film unit with modified surface layer containing capillaries. 4,419,434., Cl. 430-207.000.

Moldovanyi, Laszlo: *See*—
Strasilla, Dieter; Meindl, Hubert; Moldovanyi, Laszlo; and Fearnley, Charles, 4,419,344., Cl. 424-70.000.

Molecrete Corporation: *See*—
Hoge, John H., 4,419,135., Cl. 106-88.000.

Momose, Shinroku; and Mizunuma, Tokuichi, to Fuji Jukogyo Kabushiki Kaisha. Supercharged internal combustion engine having a compressed air driven exhaust gas ejector. 4,418,532., Cl. 60-316.000.

Monarch Marking Systems, Inc.: *See*—
Huggins, Orville C.; and Mistyurik, John D., 4,418,618., Cl. 101-68.000.

Monette, Gerald J., to Marathon Electric Manufacturing Corp. Rotary switch apparatus having a multiple arm contact spring support. 4,419,550., Cl. 200-80.00R.

Monsanto Company: *See*—
Breda, Ernest J.; and Keating, Kenneth B., 4,419,198., Cl. 204-180.00P.
Coran, Aubert Y.; Patel, Raman; and Williams, Debra, 4,419,499., Cl. 525-424.000.
Crutchfield, Marvin M., 4,419,258., Cl. 252-89.100.
Ho, Stanley S., 4,419,460., Cl. 521-123.000.
Hobbs, Charles F., 4,419,526., Cl. 585-435.000.
Hobbs, Charles F., 4,419,527., Cl. 585-435.000.
Simon, Robert H. M., 4,419,492., Cl. 525-71.000.

Montalvo, Victor H., to Walters, Michael F., a part interest. Sulphur dioxide converter and pollution arrester system. 4,419,331., Cl. 422-170.000.

Montgomery, John R., to Jobst Institute, Inc. Measuring tape. 4,418,477., Cl. 33-179.000.

Montierth, Max R.: *See*—
Frost, Rodney I.; and Montierth, Max R., 4,419,108., Cl. 55-97.000.

Moody, Albert L., to F. C. Brown Rentals, Inc. Asphalt heating kettle apparatus. 4,418,681., Cl. 126-343.50R.

Moore, Richard H.: *See*—
Strauss, H. William; Moore, Richard H.; and Alpert, Nathaniel M., 4,419,585., Cl. 250-505.100.

Moore, William H.: *See*—
Trosky, William J.; Eichler, Kenneth M.; Mandel, Alan F.; and Moore, William H., 4,418,795., Cl. 187-29.00R.

Morel, Thomas J.; and Haynes, Stewart, Jr., to Texaco Inc. Method of enhanced oil recovery employing nitrogen injection. 4,418,753., Cl. 166-273.000.

Moreland, Ronald; and Hawkins, Marion L., to Diamond Carpet Mills, Incorporated. Method and system for reclaiming and recycling gum and water in a carpet dyeing process. 4,418,433., Cl. 8-149.100.

Moretto, Hans-Heinrich: *See*—
Ackermann, Jurgen; Moretto, Hans-Heinrich; Kniege, Wilfried; and Rauer, Werner, 4,419,474., Cl. 524-195.000.

Morgan, Ronald W. Drapery pleat and fold line marking machine. 4,418,478., Cl. 33-192.000.

Mori, Kunio: *See*—
Sasaki, Yutaka; Mori, Kunio; Moriya, Kiyoshi; and Utsumi, Hiroshi, 4,419,267., Cl. 502-26.000.

Mori, Takashi; Hosokawa, Shuuji; and Naito, Takao, to Matsushita Electric Industrial Company, Limited. Power-driven screwdriver with a torque control. 4,418,765., Cl. 173-12.000.

Moriya, Kiyoshi: *See*—
Sasaki, Yutaka; Mori, Kunio; Moriya, Kiyoshi; and Utsumi, Hiroshi, 4,419,267., Cl. 502-26.000.

Mork, Orlan H. Soil leveling apparatus. 4,418,759., Cl. 172-197.000.

Morozova, Lilia V.: *See*—
Kolesnik, Anatoly G.; Kadnikova, Galina I.; Morozova, Lilia V.; and Boginskaya, Lidia M., 4,419,341., Cl. 424-52.000.

Morris, James E., to Bell Telephone Laboratories, Incorporated. Bias circuit for microwave FETs. 4,419,632., Cl. 330-277.000.

Morris, Richard W.: *See*—
Gilliland, Keith E.; and Morris, Richard W., 4,418,508., Cl. 52-282.000.

Morrison, Eric F., to Ampex Corporation. Digital chrominance filter for digital component television system. 4,419,686., Cl. 358-13.000.

Mortensen, Donald G.: *See*—
Orlando, Franklin P.; and Mortensen, Donald G., 4,418,521., Cl. 56-330.000.

Moskovsky Institut Khimicheskogo Mashinostroenia: *See*—
Bodrov, Igor S.; Gadz, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., 4,418,530., Cl. 60-39.181.

Mostek Corporation: *See*—
Gemmell, Robert M.; and Hildebrand, David B., 4,419,594., Cl. 307-297.000.

Motion Control, Inc.: *See*—
Jacobsen, Stephen C.; Luntz, Richard D.; and Hanover, Barry K., 4,419,092., Cl. 604-20.000.

Motohashi, Minoru, to Pioneer Electronic Corporation. Automatic digital control device for exact frequency tuning of a receiver. 4,419,767., Cl. 455-164.000.

Motorola Inc.: *See*—
Bjornholt, John E., 4,419,760., Cl. 375-120.000.
Dzung, John C.; Perkey, Harry J.; and Schmitz, George J., 4,418,830., Cl. 220-81.00R.
Ganucheau, Charles J., Jr., 4,419,668., Cl. 340-825.440.
Phipps, John P., 4,419,586., Cl. 250-551.000.

Mouterde, Pierre; and Mutschler, Ulrich. Hook for Jacquard machine. 4,418,725., Cl. 139-59.000.

Mowbray, Dorian F., to Lucas Industries plc. Fuel injection nozzles. 4,418,870., Cl. 239-533.800.

Mowe, Wayne T.: *See*—
Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,419,313., Cl. 264-167.000.

Moyer, Anthony M.; and Kelly, Robert H., to Gang-Nail Systems, Inc. Structural joint connector. 4,418,509., Cl. 52-693.000.

Moynihan, John T., to American Newspaper Publishers Association. Printing ink. 4,419,132., Cl. 106-27.000.

MTU Motoren-und Turbinen-Union Friedrichshafen GmbH: *See*—
Deutschmann, Herbert, 4,418,536., Cl. 60-602.000.

Mueller, Richard A., to Cities Service Company. Apparatus and process for expanding to join a tube into a tube sheet opening. 4,418,457., Cl. 29-157.400.

Muench, Jerome T.: *See*—
Campbell, George W.; and Muench, Jerome T., 4,419,387., Cl. 427-215.000.

Mulfeld, Stanley. Module for projecting motion pictures through a camera. 4,418,995., Cl. 352-129.000.

Muller, Christine, executrix: *See*—
Dubiel, Oswald; Hirtsiefer, Karl R.; Muller, Johann, deceased; and Muller, Christine, executrix, 4,418,590., Cl. 81-467.000.

Muller, Felix: *See*—
Muller, Hans; and Muller, Felix, 4,419,244., Cl. 210-629.000.

Muller, Gerhard: *See*—
Hauffe, Dieter; Muller, Gerhard; Rausch, Werner; and Volling, Gudrun, 4,419,199., Cl. 204-181.00R.

Muller, Hans; and Muller, Felix, to Chemap AG. Method and arrangement for aeration of liquids. 4,419,244., Cl. 210-629.000.

Muller, Heinz: *See*—
Engler, Walter; Erdmannsdorfer, Hans; Muller, Heinz; and Wagner, Manfred, 4,418,662., Cl. 123-198.00D.

Muller, Johann, deceased: *See*—
Dubiel, Oswald; Hirtsiefer, Karl R.; Muller, Johann, deceased; and Muller, Christine, executrix, 4,418,590., Cl. 81-467.000.

Muller, Karin Saran nee, heiress: *See*—
Reuter, Herbert; Saran, Herbert, deceased; and Witthaus, Martin, 4,419,260., Cl. 252-174.130.

Muller, Klaus; Rieger, Franz; and Linder, Ernst, to Robert Bosch GmbH. Fuel supply system. 4,418,672., Cl. 123-478.000.

Muller, Klaus: *See*—
Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; Raff, Lothar; Rieger, Franz; and Wiedenmann, Hans-Martin, 4,419,190., Cl. 204-1.00T.
Dietz, Hermann; Holfelder, Gerhard; Muller, Klaus; and Reber, Harald, 4,419,212., Cl. 204-424.000.

Mummert, Thomas A., to Jobst Institute, Inc. Apparatus and method for applying a dynamic pressure wave to an extremity. 4,418,690., Cl. 128-24.00R.

Muncke, Ludwig; and Kaus, Wolfgang, to G. L. Rexroth GmbH. Support unit for a cab in utilitarian vehicles. 4,418,955., Cl. 296-190.000.

Murai, Nobuaki: *See*—
Sakai, Yasuharu; Murai, Nobuaki; and Nakano, Kiyotaka, 4,418,562., Cl. 72-444.000.

Murakami, Ryoichi; Shimizu, Hideo; Yoshii, Takashi; Ishida, Minoru; and Yonekura, Hiroto, to Amchem Products, Inc. Phosphating process of metal surface. 4,419,147., Cl. 148-31.500.

Murakami, Shotoku: *See*—
Ichinose, Shiro; Machida, Saneto; Murakami, Shotoku; and Furusawa, Teruo, 4,419,613., Cl. 318-632.000.

Murphy, Robert A.; and Fehrmann, George L., to Apcom, Inc. Heating element for electric water heater. 4,419,567., Cl. 219-336.000.

Murrell, Lawrence L.: *See*—
Grenoble, Dane C.; Kim, Chang J.; and Murrell, Lawrence L., 4,419,222., Cl. 208-120.000.

Muschelknautz, Edgar; and Rink, Norbert, to Bayer Aktiengesellschaft. Apparatus for production of mineral wool fibers. 4,419,117., Cl. 65-16.000.

Muskovits, Jozsef: *See*—
Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezso; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, 4,419,524., Cl. 562-506.000.

Musy, Jacques, to Compagnie Generale des Etablissements Michelin. Tire, particularly for airplanes, having a crown reinforcement with extensible edges and method of manufacturing same. 4,418,735., Cl. 152-200.000.

Muto, Nobuyoshi; Sakai, Keijiro; and Matsuda, Yasuo, to Hitachi, Ltd. Method of controlling pulse width modulated inverter for use in induction motor drive. 4,419,615., Cl. 318-811.000.

Mutschler, Ulrich: *See*—
Mouterde, Pierre; and Mutschler, Ulrich, 4,418,725., Cl. 139-59.000.

Myers, Edward T.: *See*—
Doyle, Richard F.; Gausman, Thomas E.; and Myers, Edward T., 4,419,536., Cl. 174-52.00R.

Myers, George D.; and Busch, Lloyd E., to Ashland Oil, Inc. Carbometallic oil conversion with water. 4,419,223., Cl. 208-120.000.

Myers, Robert M., to Rohm and Haas Company. Treated polyacetylene. 4,419,277., Cl. 252-500.000.

Naarmann, Herbert: *See*—
Brandstetter, Franz; Echte, Adolf; Naarmann, Herbert; and Priebe, Edmund, 4,419,478., Cl. 524-318.000.

Nabisco Brands, Inc.: *See*—
Stroz, John J.; and Slee, Andrew M., 4,419,346., Cl. 424-151.000.

Nadelson, Jeffrey: *See*—
Brand, Leonard J.; and Nadelson, Jeffrey, 4,419,353., Cl. 424-248.400.

Nagai, Isao: *See*—
Ueshima, Michio; Takahashi, Yoshiyuki; Kitada, Ritsuo; and Nagai, Isao, 4,419,270., Cl. 502-209.000.

Nagai, Shigeo, to Nisshin Kogyo Kabushiki Kaisha. Centrifugal clutch brake arrangement for farm work machinery or other apparatus. 4,418,808., Cl. 192-18.00R.

Nagase, Masaomi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and apparatus for controlling the air intake of an internal combustion engine. 4,418,665., Cl. 123-339.000.

Nagase, Toshio: *See*—
Takahashi, Mutsumi; Uwabe, Toshio; Nagase, Toshio; Sato, Shosuke; and Matsuzawa, Hideshi, 4,419,572., Cl. 235-69.000.

Nagashima, Nao, to Canon Kabushiki Kaisha. Image processing apparatus utilizing digital display means. 4,419,006., Cl. 355-14.00R.

Nagel, Dietmar: *See*—
Kennedy, Melvin R.; and Nagel, Dietmar, 4,418,495., Cl. 46-206.000.

Nagel, Rudolf: *See*—
Boning, Bernward; Nagel, Rudolf; Honig, Gunter; Kiescke, Uwe; and Theuerkauf, Heinz, 4,418,567., Cl. 73-35.000.

Nagle, Joseph J.; and Vitko, Joseph, Jr. Circuit board case. 4,418,820., Cl. 206-334.000.

Nahara, Akira: *See*—
Arai, Yoshihiro; and Nahara, Akira, 4,419,404., Cl. 428-336.000.

Nahra, John E.; and Woods, Walter, to Dasi Industries, Inc. Method and apparatus for treating fluent materials. 4,419,301., Cl. 261-118.000.

Naito, Takao: *See*—
Mori, Takashi; Hosokawa, Shuuji; and Naito, Takao, 4,418,765., Cl. 173-12.000.

Naito, Yoshinao: *See*—
Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, 4,419,643., Cl. 335-234.000.

Nakagawa, Katsuyuki; and Oda, Naoki, to Sankin Industry Co., Ltd. Handy torch. 4,419,072., Cl. 431-266.000.

Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; and Ozaki, Tsuyoshi, to National Research Institute for Metals. Continuous melting, refining and casting process. 4,419,128., Cl. 75-46.000.

Nakagawa, Seiichi, to JEOL Ltd. Magnetic objective lens for use in a scanning electron microscope. 4,419,581., Cl. 250-396.0ML.

Nakagawa, Yasuhiko: *See*—
Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; and Maruyama, Ryuzaburo, 4,419,601., Cl. 313-131.00A.

Nakahara, Motohiro; Yoshioka, Naoki; Yokota, Hiroshi; Miyajiri, Tetsuo; and Watanabe, Minoru, to Nippon Telegraph and Telephone Public Corporation; and Sumitomo Electric Industries Limited. Process for producing optical fiber preform and apparatus therefor. 4,419,116., Cl. 65-3.120.

Nakai, Fumio: *See*—
Sakano, Hajime; Nakai, Fumio; and Tomari, Yukio, 4,419,491., Cl. 525-67.000.

Nakai, Meroji: *See*—
Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; and Maruyama, Ryuzaburo, 4,419,601., Cl. 313-131.00A.

Nakajima, Hideki, to Shimano Industrial Company Limited. Fishing reel. 4,418,877., Cl. 242-84.21R.

Nakajyo, Hironori: *See*—
Nokihara, Yutaka; Nakajyo, Hironori; and Yoshida, Kimio, 4,419,749., Cl. 369-11.000.

Nakamura, Hideo: *See*—
Sakai, Yoshio; and Nakamura, Hideo, 4,419,684., Cl. 357-40.000.

Nakamura, Ikushi: *See*—
Tominaga, Shinji; Imura, Toshinori; and Nakamura, Ikushi, 4,419,001., Cl. 354-173.100.

Nakamura, Tadashi; and Hara, Haruo, to Konishiroku Photo Industry Co., Ltd. Data converting method for reordered prints. 4,419,009., Cl. 355-103.000.

Nakamura, Tadashi: *See*—
Teraoka, Akira; and Nakamura, Tadashi, 4,418,783., Cl. 180-209.000.

Nakamura, Takeshi: *See*—
Hamano, Toshihisa; Ito, Hisao; Takenouchi, Mutsuo; Ozawa, Takashi; Fuse, Mario; and Nakamura, Takeshi, 4,419,696., Cl. 358-294.000.

Nakanishi, Ichiro: *See*—
Sugiyama, Masatoshi; Nakanishi, Ichiro; and Suzuki, Yoshiaki, 4,419,388., Cl. 427-288.030.

Nakano, Kiyotaka: *See*—
Sakai, Yasuharu; Murai, Nobuaki; and Nakano, Kiyotaka, 4,418,562., Cl. 72-444.000.

Nakashima, Atushi; Edamatu, Michisuke; and Kushi, Kenji, to Mitsubishi Rayon Company, Ltd. Dip-coating apparatus. 4,418,641., Cl. 118-429.000.

Nakayama, Masafumi; Yanai, Tokiyoshi; and Fukino, Masato, to Nissan Motor Company, Limited. Control apparatus for vehicle steering system. 4,418,779., Cl. 180-141.000.

Nakazawa, Toru, to Mita Industrial Co., Ltd. Sensitized electrophotographic photosensitive composition. 4,419,429., Cl. 430-83.000.

Nakazima, Masatoshi, to Yamah Motor Co., Ltd. Guard device of snowmobile against splashes of snow. 4,418,782., Cl. 180-190.000.

Nalco Chemical Company: *See*—
Kelly, John A.; and Soderquist, Cynthia A., 4,419,327., Cl. 422-17.000.
Kennedy, Carl S.; and Hack, Theodore A., 4,419,253., Cl. 252-34.700.

Namazugoshi, Takeo: *See*—
Yamamoto, Mitsuo; Namazugoshi, Takeo; and Seto, Hiroyoshi, 4,419,163., Cl. 156-94.000.

Nanda, Vinod K., to Vickers, Incorporated. Power transmission. 4,418,612., Cl. 91-445.000.

Nandagiri, Arun: *See*—
Pong, Richard G. S.; Nandagiri, Arun; Bilynskyj, Oleh M.; and Hunter, Le Roy, 4,418,846., Cl. 222-189.000.

Narducy, Kenneth W.: *See*—
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,419,461., Cl. 521-126.000.

Narita, Ryuuho: *See*—
Oota, Hiroyuki; and Narita, Ryuuho, 4,418,614., Cl. 99-280.000.

Naster, Ronald J.; Zaidel, Simon A.; Hwang, Ying-Chen; Parks, Earl L.; and Cady, William R., to General Electric Company. Method for fabricating silicon-on-sapphire monolithic microwave integrated circuits. 4,418,470., Cl. 29-577.00C.

Nate, Kazuo; Kobayashi, Toshio; and Isogai, Tokio, to Hitachi, Ltd. Radiation sensitive polymer materials. 4,419,506., Cl. 526-316.000.

Nath, Prem, to Energy Conversion Devices, Inc. Solar cell and method for producing same. 4,419,530., Cl. 136-251.000.

National Institute for Researches in Inorganic Materials: *See*—
Ishii, Toshihiko; and Sato, Tadao, 4,419,335., Cl. 423-290.000.

National Research Institute for Metals: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; and Ozaki, Tsuyoshi, 4,419,128., Cl. 75-46.000.
Tachikawa, Kyoji; Sekine, Hisashi; Itoh, Kikuo; and Iijima, Yasuo, 4,419,145., Cl. 148-11.50F.

National Semiconductor Corporation: *See*—
Russell, Gilbert E.; and Wong, Hee, 4,419,689., Cl. 358-37.000.

National Starch and Chemical Corporation: *See*—
Puletti, Paul P.; and Stubler, Catherine E., 4,419,494., Cl. 525-95.000.

Naudin, Hildebert: *See*—
Dumas, Jean A.; and Naudin, Hildebert, 4,419,111., Cl. 55-388.000.

NCR Corporation: *See*—
Christensen, Gay A.; Franco, Gerard; and Wildey, Theron L., 4,419,736., Cl. 364-900.000.

Neat, Clarence E.; and Neat, Mark A. Scabrous surface light director. 4,419,397., Cl. 428-141.000.

Neat, Mark A.: *See*—
Neat, Clarence E.; and Neat, Mark A., 4,419,397., Cl. 428-141.000.

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Finet, Alain; Nerone, Louis R.; and Zenisek, Michael J., 4,418,773., Cl. 177-16.000.
Nesper, Reinhard: *See*—
Gruttner, Andreas; Nesper, Reinhard; and von Schnering, Hans-Georg, 4,419,151., Cl. 148-400.000.
Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., to Syntex (U.S.A.) Inc. Nonapeptide and decapeptide analogs of LHRH, usefull as LHRH antagonists. 4,419,347., Cl. 424-177.000.
Neuman, Marcel, to Biomass Development S.A. Machine for continuously densifying ligno-cellulosic or like materials. 4,419,066., Cl. 425-371.000.
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Neumann, Peter: *See*—
Graser, Fritz; Hoffmann, Gerhard; Leyrer, Reinhold J.; and Neumann, Peter, 4,419,427., Cl. 430-58.000.
New Nippon Electric Co., Ltd.: *See*—
Hetsugi, Seiji, 4,419,661., Cl. 340-707.000.
Nguyen-Thanh, Thong: *See*—
Pouderoux, Pierre; Salon, Guy; and Nguyen-Thanh, Thong, 4,418,748., Cl. 165-134.00R.
NHK Spring Co., Ltd.: *See*—
Shinbori, Takeyoshi, 4,418,896., Cl. 267-36.00R.
Nicholas, Earl C.: *See*—
Streeter, Robert R.; Whitehorn, Vincent J.; and Nicholas, Earl C., 4,418,616., Cl. 99-458.000.
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Schultz, Steven C.; and Vaughn, Thomas A., 4,418,951., Cl. 292-202.000.
Nichols, Jimmy B., to Emerson Electric Co. Meter controlled dispensing apparatus. 4,418,839., Cl. 222-14.000.
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Nielsen, John C., to Visymonde Investment PTE Ltd. Carton with handle. 4,418,864., Cl. 229-52.00B.
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Niermann, Hermann; Reichert, Gunter; Ebert, Hans; and Neumann, Friedrich, to Hoechst Aktiengesellschaft. Preparing P_2S_5 of low reactivity. 4,419,104., Cl. 23-293.00R.
Niewold, Donald W. Truck auger-hopper construction. 4,419,037., Cl. 414-489.000.
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Wachi, Masatada, 4,418,600., Cl. 84-1.190.
Nippon Kokan Kabushiki Kaisha: *See*—
Nomura, Hirokazu; and Sugitani, Yuji, 4,419,563., Cl. 219-137.00R.
Yoshimi, Kazuhiko; Shimizu, Kazuyuki; Watari, Takashi; and Kusumoto, Katsunori, 4,418,632., Cl. 114-102.000.
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Nippon Oil Company, Limited: *See*—
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Nippon Piston Ring Co., Ltd.: *See*—
Ebihara, Tadashi, 4,419,413., Cl. 428-548.000.
Nippon Shokubai Kagaku Kogyo Co. Ltd.: *See*—
Ueshima, Michio; Takahashi, Yoshiyuki; Kitada, Ritsuo; and Nagai, Isao, 4,419,270., Cl. 502-209.000.
Nippon Soken, Inc.: *See*—
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Nippon Telegraph and Telephone Public Corporation: *See*—
Nakahara, Motohiro; Yoshioka, Naoki; Yokota, Hiroshi; Miyajiri, Tetsuo; and Watanabe, Minoru, 4,419,116., Cl. 65-3.120.
Sugawara, Yoshitaka; Kamei, Tatsuya; and Sakurai, Tetsuma, 4,419,685., Cl. 357-53.000.
Nippondenso Co., Ltd.: *See*—
Ito, Yoji; Inoue, Yozo; and Hara, Kiyoshi, 4,419,730., Cl. 364-424.000.
Shiga, Tsutomu; and Nimura, Takayasu, 4,419,597., Cl. 310-68.00D.
Yamauchi, Yasutaka; and Itou, Hiroshi, 4,418,666., Cl. 123-339.000.
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Nishimatsu, Masaharu: *See*—
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Nishimoto, Kanichi, to Noritsu Koki Co., Ltd. Photographic color printer. 4,419,008., Cl. 355-38.000.
Nishimura, Katsuo; and Watanabe, Minoru, to Citizen Watch Company Limited. Analog display type electronic timepiece. 4,419,019., Cl. 368-74.000.
Nishina, Shuho: *See*—
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Nishino, Atsushi; Suzuki, Tadashi; and Sonetaka, Kazunori, to Matsushita Electric Industrial Company, Limited. Steam generator. 4,419,302., Cl. 261-142.000.
Nishizawa, Kazunori: *See*—
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Chiba, Yoshiharu; Umezawa, Hidetsugu; Sakabe, Takao; and Arai, Ryuji, 4,418,729., Cl. 139-452.000.
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,418,660., Cl. 123-143.00B.
Fukushima, Naoto; Iwata, Kazuroh; and Hidaka, Kunihiko, 4,418,802., Cl. 188-282.000.
Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; and Maruyama, Ryuzaburo, 4,419,601., Cl. 313-131.00A.
Imai, Iwao; and Sone, Masazumi, 4,419,547., Cl. 200-19.00R.
Ito, Hideo; and Yabuta, Keiichiro, 4,418,780., Cl. 180-142.000.
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Oshima, Masaharu; Ikezawa, Kenji; and Aoki, Hiroyuki, 4,419,213., Cl. 204-425.000.
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Nitskevich, Vladimir P.: *See*—
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Nittel, Fritz; and Mader, Helmut, to Agfa-Gevaert Aktiengesellschaft. Dispersion process. 4,419,441., Cl. 430-377.000.
Nitto Boseki Co., Ltd.: *See*—
Sato, Michio; Kasai, Shin; and Kawaguchi, Yutaka, 4,418,876., Cl. 242-18.00G.
Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; Mori, Kunio; Moriya, Kiyoshi; and Utsumi, Hiroshi, 4,419,267., Cl. 502-26.000.
Noboru Tominari: *See*—
Tominari, Noboru; and Ishida, Takashi, 4,418,673., Cl. 123-478.000.
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Kubbota, Massashi; and Noda, Touru, 4,419,433., Cl. 430-206.000.
Noeller, Hans G. Polarization fluoroimmunoassay with pulsed light source. 4,419,583., Cl. 250-458.100.
Noerpel, Anthony R., to Bell Telephone Laboratories, Incorporated. Small dual frequency band hybrid mode feed. 4,419,671., Cl. 343-786.000.
Nogami, Masaharu, to Fujitsu Limited. Method of vapor phase growth. 4,419,179., Cl. 156-613.000.
Nohria, Naresh K.: *See*—
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Nokihara, Yutaka; Nakajyo, Hironori; and Yoshida, Kimio, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic reproducing apparatus capable of receiving radio broadcast programs. 4,419,749., Cl. 369-11.000.
Nolin, Roger J. Simultaneously locking and unlocking dead bolt and lock latch with panic unlocking. 4,418,552., Cl. 70-107.000.
Nomura, Hirokazu; and Sugitani, Yuji, to Nippon Kokan Kabushiki Kaisha. Rotary arc-welding method. 4,419,563., Cl. 219-137.00R.
Nomura, Hiroyuki: *See*—
Kawasaki, Teruo; Kogawa, Kouichi; and Nomura, Hiroyuki, 4,419,611., Cl. 318-443.000.
Nomura, Yoshihisa: *See*—
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Noonan, John M.; Ryan, Raymond W.; and Houle, James F., to Eastman Kodak Company. Image-forming compositions and elements containing ionic polyester dispersing agents. 4,419,437., Cl. 430-270.000.
Nordquist, Albert W.: *See*—
Tollefsen, Kjell T.; and Nordquist, Albert W., 4,418,605., Cl. 84-434.000.
Nordson Corporation: *See*—
Collin, Everett E., 4,418,511., Cl. 53-427.000.
Norgren, Kent S.; and Stucka, Stephen E., to International Business Machines Corporation. Bidirection data switch sequencing circuit. 4,419,592., Cl. 307-241.000.
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Norman, Richard O.: *See*—
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North American Philips Consumer Electronics Corp.: *See*—
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Kuriakose, Areekattuthazhayil K., 4,419,336., Cl. 423-345.000.
Norton, Lyle K.: *See*—
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Notenboom, Gerardus J. A. M.: *See*—
Liefkens, Adrianus C. H. J.; and Notenboom, Gerardus J. A. M., 4,419,415., Cl. 428-594.000.
Nowak, Florian I. Collet closing mechanism. 4,418,925., Cl. 279-50.000.
Nukem GmbH: *See*—
Reus, Josef; Wewer, Hans; and Jurgen, Hofmann, 4,419,333., Cl. 423-235.000.
Nuovo Pignone S.p.A.: *See*—
Santucci, Nicola, 4,418,727., Cl. 139-448.000.
Nussli, Jacques; Marandas, Georges J. P.; and Farrayre, Antoine, to U.S. Philips Corporation. Bialkaline photocathode having increased spectral sensitivity and method of manufacturing same. 4,419,603., Cl. 313-346.00R.
Oakley, Charles B.: *See*—
Dischert, Robert A.; and Oakley, Charles B., 4,419,687., Cl. 358-13.000.
O'Brien, Joseph: *See*—
Brown, Paul; and O'Brien, Joseph, 4,418,702., Cl. 128-760.000.
O'Brien, Steven M., to Sperry Corporation. Automatic synchronous switch for a plurality of asynchronous oscillators. 4,419,629., Cl. 328-72.000.
O'Brien, Teresa M.: *See*—
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Hauffe, Dieter; Muller, Gerhard; Rausch, Werner; and Volling, Gudrun, 4,419,199., Cl. 204-181.00R.
Hindersinn, Raymond R., 4,419,400., Cl. 428-245.000.
O'Connor, John W., to Allis-Chalmers Corporation. Pin lock for adjustable link of a three-point hitch. 4,418,935., Cl. 280-461.00A.
Oda, Chikao: *See*—
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Oda, Naoki: *See*—
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O'Dwyer, James B.: *See*—
Piccirilli, Robert M.; Chang, Wen-Hsuan; Porter, Samuel, Jr.; O'Dwyer, James B.; and Lee, Kyu-Wang, 4,419,407., Cl. 428-423.100.
O'Dwyer, Thomas L.: *See*—
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Office of Monopoly: *See*—
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Ogawa, Kazufumi; and Kitahiro, Isamu, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing color filter. 4,419,425., Cl. 430-7.000.
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McNeill, Robert C., 4,418,463., Cl. 29-527.400.
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O'Hara, Robert J. Multi-cable conduit for floors and walls. 4,419,535., Cl. 174-48.000.
Ohmori, Tsuguharu; and Hayashi, Shizuo, to Fuji Electric Company, Ltd. Method for measuring the extent of slag deposit buildup in a channel induction furnace. 4,419,755., Cl. 373-145.000.
Ohmuro, Shigeru: *See*—
Yamamoto, Yoshihiro; Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, 4,419,695., Cl. 358-198.000.
Ohshita, Masayuki; Horiuchi, Toshiaki; Yamanaka, Takashi; and Usui, Yoshihiro, to Mitsubishi Denki Kabushiki Kaisha. Vacuum type circuit breaker. 4,419,553., Cl. 200-144.00B.
Ohshita, Takahiro: *See*—
Ishihara, Hideo; Ohshita, Takahiro; and Saito, Harumitsu, 4,419,330., Cl. 422-143.000.
Ohta, Shigeto: *See*—
Katagiri, Kazuharu; Ishikawa, Shozo; Watanabe, Katsunori; Ohta, Shigeto; and Kitahara, Makoto, 4,419,428., Cl. 430-77.000.
Ohye, Hideo: *See*—
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Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, to Hosiden Electronics Co., Ltd. Self-sustaining solenoid. 4,419,643., Cl. 335-234.000.
Okada, Masahiro: *See*—
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O'Keefe, John J., II, to General Motors Corporation. Electrical connector for a slide-in component. 4,418,975., Cl. 339-91.00R.
Okuyama, Yasuhiko; and Takezono, Takashi, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Electronic clock. 4,419,017., Cl. 368-64.000.
Olah, George A., to PCUK - Produits Chimiques Ugine Kuhlmann. Regioselective preparation of α- or β-naphthol. 4,419,528., Cl. 568-741.000.
Olin Corporation: *See*—
Gray, Thomas J., 4,419,208., Cl. 204-290.00R.
Pryor, Michael J.; Tyler, Derek E.; and Yarwood, John C., 4,419,177., Cl. 156-601.000.
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Olsson, O. A. Torsten; Svensson, Leif A.; and Wetterlin, Kjell I. L., to Aktiebolaget Draco. Bronchospasmolytic carbamate derivatives. 4,419,364., Cl. 424-300.000.
Olympus Optical Co., Ltd.: *See*—
Kanazawa, Akira, 4,418,689., Cl. 128-6.000.
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Omron Tateisi Electronics Co.: *See*—
Agatahama, Shunichi, 4,419,640., Cl. 335-106.000.
Ono, Chikai: *See*—
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Oosawa, Takashi: *See*—
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Oota, Hiroyuki; and Narita, Ryuuho, to Tokyo Shibaura Denki Kabushiki Kaisha. Control device for coffee extractor. 4,418,614., Cl. 99-280.000.
Oota, Yoshihiko: *See*—
Shiraishi, Yuna; and Oota, Yoshihiko, 4,419,698., Cl. 358-330.000.
Oppermann, Walter J., to American Can Company. Method of heating contents in a self venting container. 4,419,373., Cl. 426-234.000.
Optilon W. Erich Heilmann GmbH: *See*—
Heimberger, Helmut; and Wulz, Helmut, 4,418,449., Cl. 24-401.000.
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Yannas, Ioannis V.; Burke, John F.; Orgill, Dennis P.; and Skrabut, Eugene M., 4,418,691., Cl. 128-156.000.
Orlando, Franklin P.; and Mortensen, Donald G., to FMC Corporation. Harvester with selective force balanced shaking mechanism. 4,418,521., Cl. 56-330.000.
Orsa Kattingfabrik AB: *See*—
Kallaes, Elis; and Starell, Karl-Erik, 4,418,891., Cl. 254-260.000.
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Osaka Gas, Ltd.: *See*—
Yamamoto, Mitsuo; Namazugoshi, Takeo; and Seto, Hiroyoshi, 4,419,163., Cl. 156-94.000.
Osborne, Anthony, to Kearney-National, Inc. Operating mechanism for an electric switch. 4,419,549., Cl. 200-50.00A.
O'Shea, William F., Jr., to Continental-Wirt Electronics Corporation. Connector structure for flat cable. 4,418,977., Cl. 339-99.00R.
Oshima, Akio: *See*—
Tsuchiya, Shozo; Oshima, Akio; and Hayashi, Hideo, 4,419,497., Cl. 525-338.000.
Oshima, Masaharu; Ikezawa, Kenji; and Aoki, Hiroyuki, to Nissan Motor Company, Limited. Oxygen sensing element formed as laminate of thin layers on substrate provided with heater and lead wires. 4,419,213., Cl. 204-425.000.
Osika, Thomas F., to McGill Manufacturing Company, Inc. Electric switches for receiving unitary internal contact/wire terminal elements. 4,419,554., Cl. 200-284.000.
Osterhagen, Gerhard; and Feige, Siegfried, to Dynamit Nobel Aktiengesellschaft. Process and apparatus for the production of a pipe of foam material with a closure. 4,419,158., Cl. 156-66.000.
Otis Elevator Company: *See*—
Manco, Giuseppe, 4,418,794., Cl. 187-17.000.
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Paschal, James H., Jr., 4,418,750., Cl. 166-214.000.
Yonker, John H.; and Arendt, Henry P., 4,418,756., Cl. 166-383.000.
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Outboard Marine Corporation: *See*—
Borst, Gaylord M., 4,419,084., Cl. 440-58.000.
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Grossi, Anthony V.; Hagelee, Leon A.; Hahn, Louis T.; and Marzocchi, Alfred, 4,419,489., Cl. 525-54.500.
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Ozari, Yehuda: *See*—
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Ozawa, Takashi: *See*—
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P.V. Machining, Inc.: *See*—
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P. V. Tool Inc: *See*—
Vindez, Pierre G., 4,418,767., Cl. 173-19.000.

Pace, Loy D.: *See*—
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Pack Image, Inc.: *See*—
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Page, James H., to Western Manufacturing Company, Inc. Balanced implement transport vehicle. 4,418,762., Cl. 172-311.000.

Palazzo, Vito: *See*—
Jon, Min-Chung; and Palazzo, Vito, 4,419,562., Cl. 219-130.010.

Pall Corporation: *See*—
Miller, John D.; and Reed, Clayton L., 4,419,234., Cl. 210-232.000.

Pallos, Ferenc M.; and Gaughan, Edmund J., to Stauffer Chemical Company. N-(Benzenesulfonyl) carbamates-herbicidal antidotes. 4,419,523., Cl. 560-12.000.

Pallos, Laszlo: *See*—
Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, 4,419,355., Cl. 424-249.000.

Palma, James F. Apparatus and method for drilling dowel holes. 4,419,031., Cl. 408-1.00R.

Palmateer, Paul H.: *See*—
Ainslie, Norman G.; Krzanowski, James E.; and Palmateer, Paul H., 4,418,857., Cl. 228-124.000.

Panavision, Incorporated: *See*—
Gottschalk, Robert E.; and Fazekas, Carl F., 4,418,994., Cl. 352-78.00R.

Pane, Francis C., Jr.: *See*—
Faucher, Joseph E.; Wright, Richard R.; Pane, Francis C., Jr.; Kwoka, David; and Striebel, Edmund E., 4,418,543., Cl. 60-742.000.

Paragon Optical, Inc.: *See*—
Ratkowski, Donald J.; and Lue, Ping-Chang, 4,419,505., Cl. 526-279.000.

Paramount Die & Machine Products: *See*—
Shamir, Amos, 4,418,978., Cl. 339-99.00R.

Park, Hee Chung P., to Mobil Oil Corporation. Multi-layer polypropylene film structure and method of forming same. 4,419,411., Cl. 428-516.000.

Park-Ohio Industries, Inc.: *See*—
Day, Paul L., 4,419,149., Cl. 148-131.000.

Parks, Earl L.: *See*—
Naster, Ronald J.; Zaidel, Simon A.; Hwang, Ying-Chen; Parks, Earl L.; and Cady, William R., 4,418,470., Cl. 29-577.00C.

Parma Corporation: *See*—
Rogers, Walter C., Jr., 4,418,957., Cl. 297-85.000.

Partridge, Randall D.: *See*—
LaPierre, Rene B.; Partridge, Randall D.; Chen, Nai Y.; and Wong, Steven S., 4,419,220., Cl. 208-111.000.

Parus, Roger: *See*—
Georges, Jean-Francois M.; and Parus, Roger, 4,419,079., Cl. 434-43.000.

Paschal, James H., Jr., to Otis Engineering Corporation. Well tool. 4,418,750., Cl. 166-214.000.

Paschke, Edward E.; and Throne, James L., to Standard Oil Company (Indiana). Foamed thermoplastic resin comprising poly (p-methylenebenzoate). 4,419,462., Cl. 521-134.000.

Passerell, David P.: *See*—
Jacobson, Irvin D.; Volgstadt, Frank R.; and Passerell, David P., 4,418,888., Cl. 251-216.000.

Patel, Arvind M.: *See*—
Beck, James E.; and Patel, Arvind M., 4,418,566., Cl. 73-23.000.

Patel, Bhupendra C., to Kendall Company, The. Suprapubic catheter system. 4,419,094., Cl. 604-93.000.

Patel, Gajendra M., to GTE Automatic Electric Incorporated. Apparatus separating hybrid substrate from carrier plate. 4,418,459., Cl. 29-239.000.

Patel, Raman: *See*—
Coran, Aubert Y.; Patel, Raman; and Williams, Debra, 4,419,499., Cl. 525-424.000.

Patterson, Robert J., II, to United Technologies Corporation. Multi-piece rotary atomizer disk. 4,419,061., Cl. 425-8.000.

Patterson, Russell E.: *See*—
Harman, Robert K.; Clifton, Ronald W.; and Patterson, Russell E., 4,419,659., Cl. 340-552.000.

Paul, Dieter G., to Sperry Corporation. Asynchronous status register. 4,419,762., Cl. 377-66.000.

Paul-Heinz Wagner: *See*—
Dubiel, Oswald; Hirtsiefer, Karl R.; Muller, Johann, deceased; and Muller, Christine, executrix, 4,418,590., Cl. 81-467.000.

Paul, William A. Apparatus for handling gasket-forming material. 4,419,168., Cl. 156-351.000.

Paul Wurth S.A.: *See*—
Mailliet, Pierre, 4,418,894., Cl. 266-271.000.

Pauliukonis, Richard S. Modular pressure letdown valve. 4,418,717., Cl. 137-614.200.

Paulley, Thomas A.: *See*—
Warren, Hollie B., Jr.; and Paulley, Thomas A., 4,418,570., Cl. 73-304.00R.

Pauly, Marc, to Laboratorios Serobiologiques S.A. Composition usable notably as a cosmetic product allowing a tanning of the skin comprising the use of aminoacids. 4,419,343., Cl. 424-59.000.

Pavlichenko, Georgy S.: *See*—
Bondarenko, Oleg P.; Genis, Igor A.; Baglai, Vitaly M.; Fedorovsky, Boris B.; Medovar, Boris I.; Timashov, Grigory A.; Us, Vasily I.; Pavlichenko, Georgy S.; and Sidorenko, Igor G., 4,418,741., Cl. 164-454.000.

PCUK - Produits Chimiques Ugine Kuhlmann: *See*—
Olah, George A., 4,419,528., Cl. 568-741.000.

Pear, Daniel G., to Square D Company. Bus bar assembly for panelboards and switchboards. 4,419,715., Cl. 361-335.000.

Pearson, Glenn A. Fire retardant concentrates and methods. 4,419,401., Cl. 428-262.000.

Pechacek, Raymond E., to Hahn & Clay. Shell layer wrapping machine and method of positioning vessel sections of a multi-layer vessel. 4,418,560., Cl. 72-296.000.

Pedain, Josef: *See*—
Breidenbach, Peter; Bock, Manfred; Pedain, Josef; and Mennicken, Gerhard, 4,419,513., Cl. 544-222.000.

Pedersen, Carl O.; and Maurer, Herman J., to J. I. Case Company. Backhoe swing mechanism. 4,419,040., Cl. 414-687.000.

Peery, John R.: *See*—
Leeper, Harold M.; Baumrind, Nikki; and Peery, John R., 4,419,096., Cl. 604-132.000.

Peet, Norton P.; and Sunder, Shyam, to Dow Chemical Company, The. 3-(1H-Tetrazol-5-yl)-4(3H)-quinazolinones. 4,419,357., Cl. 424-251.000.

Pei, David C. T., to Bettendorf Stanford Inc. Method of baking bread. 4,419,374., Cl. 426-243.000.

Pellow, Terrence R., to Rolls-Royce Limited. Modular gas turbine engine. 4,418,528., Cl. 60-39.161.

Pendergraft, Billy D. Bumper mounted foldable crane hoist. 4,419,038., Cl. 414-543.000.

Penhasi, Harry A., to Beckman Instruments, Inc. Motion sensing apparatus. 4,418,950., Cl. 292-144.000.

Peresie, Henry J.: *See*—
Rosenberg, Barnett; Van Camp, Loretta; Ficher, Robert G.; Kansy, Samir; Peresie, Henry J.; and Davidson, James P., 4,419,351., Cl. 424-245.000.

Perfection Corporation: *See*—
Jacobson, Irvin D.; Volgstadt, Frank R.; and Passerell, David P., 4,418,888., Cl. 251-216.000.

Perkey, Harry J.: *See*—
Dzung, John C.; Perkey, Harry J.; and Schmitz, George J., 4,418,830., Cl. 220-81.00R.

Perkin-Elmer Corporation, The: *See*—
Lakatos, Edward J.; and Talmadge, Paul C., 4,419,575., Cl. 250-226.000.

Perkins, William G.; and Shriver, Clem B., to Goodyear Tire & Rubber Company, The. Novel process for deep stretch forming of polyesters. 4,419,320., Cl. 264-296.000.

Peroxide-Chemie GmbH: *See*—
Meyer, Heinz; Dorn, Maximilian; and Seidl, Hans, 4,419,197., Cl. 204-159.200.

Perrin, Cristian: *See*—
Bertails, Jean P.; Perrin, Cristian; and Tallaron, Louis, 4,419,631., Cl. 330-255.000.

Peters, Ferman: *See*—
Thomson, Timothy; and Peters, Ferman, 4,419,510., Cl. 536-84.000.

Peters, John W., to Hughes Aircraft Company. Low temperature process for depositing an oxide dielectric layer on a conductive surface and multilayer structures formed thereby. 4,419,385., Cl. 427-99.000.

Peters Machinery Company, Subsidiary of Katy Industries, Inc.: *See*—
Rose, Edward, 4,418,814., Cl. 198-406.000.

Petershack, Victor D.: *See*—
Martin, Donald E.; and Petershack, Victor D., 4,418,817., Cl. 198-845.000.

Peterson, Bruce R.: *See*—
Harrison, Joel N.; Daniels, Donald V.; and Peterson, Bruce R., 4,419,701., Cl. 360-77.000.

Petocz, Lujza: *See*—
Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, 4,419,355., Cl. 424-249.000.

Petrzilka, Martin, to Hoffmann-La Roche Inc. Pyridazines. 4,419,262., Cl. 252-299.610.

Pfaff Industriemaschinen GmbH: *See*—
Mall, Gunther; and Stephan, Willi, 4,418,629., Cl. 112-146.000.

Pfizer Inc.: *See*—
Crawford, Thomas C.; and Jasys, Vytautas J., 4,419,284., Cl. 260-245.20R.
Sarges, Reinhard, 4,419,521., Cl. 549-404.000.

Phillips Cables Ltd.: *See*—
Williams, Gary S., 4,418,982., Cl. 350-96.200.

Phillips, Donald E., to Rockwell International Corporation. Phase lock loop. 4,419,633., Cl. 331-17.000.

Phillips Petroleum Company: *See*—
Kukes, Simon G.; and Davis, Thomas, 4,419,225., Cl. 208-251.00R.
McDaniel, Max P., 4,419,268., Cl. 502-158.000.
Shioyama, Tod K.; and Straw, Jim J., 4,419,525., Cl. 568-401.000.

Phipps, John P., to Motorola, Inc. Solid-state relay and regulator. 4,419,586., Cl. 250-551.000.

Phoenix Products Company, Inc.: *See*—
Gregoire, Brian R.; and Yantz, Rupert O., 4,419,721., Cl. 362-368.000.

Photovolt Corporation: *See*—
Wang, Minchen, 4,419,210., Cl. 204-403.000.

Piccirilli, Robert M.; Chang, Wen-Hsuan; Porter, Samuel, Jr.; O'Dwyer, James B.; and Lee, Kyu-Wang, to PPG Industries, Inc. Elastomeric coating compositions. 4,419,407., Cl. 428-423.100.

Piedmont, James R.; and Hacskaylo, Michael, to United States of America, Army. Method of making a linear light detecting diode integrated circuit. 4,418,466., Cl. 29-572.000.

Pierce, Stanley L., to Ford Motor Company. Four speed ratio transverse automatic transmission. 4,418,585., Cl. 74-695.000.

Piffath, Rodney S., to Firelite Products Inc. Flame igniter. 4,419,069., Cl. 431-89.000.

Pigman, John H.: *See*—
Woods, William D.; and Pigman, John H., 4,418,901., Cl. 269-71.000.

Pilachowski, Martin T.; and Ritz, Alan J., to Wacker Corporation. Trash pump with resilient liner. 4,419,048., Cl. 415-196.000.

Pillitteri, Noreen J., to Keuffel & Esser Company. Diazotype composition stabilization. 4,419,432., Cl. 430-179.000.

Pinches, Anthony: *See*—
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., 4,419,243., Cl. 210-618.000.

Pinter, Andras: *See*—
Balint, Valer; Pinter, Andras; and Mika, Gyorgy, 4,419,214., Cl. 208-8.00R.

Pioneer Electronic Corporation: *See*—
Motohashi, Minoru, 4,419,767., Cl. 455-164.000.

Piper, Harlow H., to Caterpillar Tractor Co. Position indicator for a truck body. 4,418,636., Cl. 116-28.00R.

Pippard, David A.: *See*—
Cayless, Richard A.; and Pippard, David A., 4,419,137., Cl. 106-14.390.

Pitney Bowes Inc.: *See*—
Diel, Paul A., 4,418,619., Cl. 101-269.000.
Foster, Dean H.; Mersereau, Robert E.; and Silverman, Harold, 4,418,515., Cl. 53-457.000.

Plahm, Jack E., to Rexham Corporation. Packaging machine with means for closing flexible pouches around a nozzle. 4,418,513., Cl. 53-434.000.

Plessey Overseas Limited: *See*—
Rutter, Phillip, 4,419,744., Cl. 365-154.000.

Pletcher, Erwin C. Orthodontic bracket. 4,419,078., Cl. 433-10.000.

Poclain: *See*—
Leroux, Jean E., 4,418,775., Cl. 180-9.620.

Podmaniczky, Andras: *See*—
Markus Lenk, Attila; Podmaniczky, Andras; and Tokes, Szabolcs, 4,419,676., Cl. 346-108.000.

Pohang Iron & Steel Co., Ltd.: *See*—
Sin, Yoon K.; and Kim, Daiuk, 4,419,274., Cl. 502-304.000.

Pohl, Ludwig: *See*—
Eidenschink, Rudolf; Romer, Michael; and Pohl, Ludwig, 4,419,264., Cl. 252-299.630.

Poklemba, John J., to Communications Satellite Corporation. Concurrent carrier and clock synchronization for data transmission system. 4,419,759., Cl. 375-97.000.

Polaroid Corporation: *See*—
Falxa, Martin L.; and Himmelwright, Richard S., 4,419,442., Cl. 430-567.000.

Pollman, Frederic W., to Sundstrand Corporation. Reversible regenerating electric vehicle drive. 4,419,610., Cl. 318-12.000.

Polyplex Plastics, Inc.: *See*—
Fischer, Theodore E., 4,419,162., Cl. 156-94.000.

Pompei, Michel: *See*—
Bertin, Jacques; Pompei, Michel; and Valjent, Jean-Pierre, 4,418,895., Cl. 267-140.100.

Pompili, Antonio: *See*—
Turco, Vincenzo; and Pompili, Antonio, 4,419,318., Cl. 264-274.000.

Pong, Richard G. S.; Nandagiri, Arun; Bilynskyj, Oleh M.; and Hunter, Le Roy, to American Cyanamid Company. Aerosol dispensing system. 4,418,846., Cl. 222-189.000.

Ponomarenko, Juri F.: *See*—
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715., Cl. 137-508.000.

Ponomarev, Ivan K.: *See*—
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,418,749., Cl. 165-139.000.

Popovics, Sandor. Accelerator additive for cementitious compositions. 4,419,138., Cl. 106-90.000.

Porchet, Marcel. Curved glass ice-scraper. 4,418,439., Cl. 15-236.00R.

Porter, Samuel, Jr.: *See*—
Piccirilli, Robert M.; Chang, Wen-Hsuan; Porter, Samuel, Jr.; O'Dwyer, James B.; and Lee, Kyu-Wang, 4,419,407., Cl. 428-423.100.

Potters Industries, Inc.: *See*—
Abrams, John C., 4,419,279., Cl. 252-514.000.

Potts, Vivian E.: *See*—
Nichols, Buford L., Jr.; Klish, William J.; and Potts, Vivian E., 4,419,369., Cl. 426-2.000.

Pouderoux, Pierre; Salon, Guy; and Nguyen-Thanh, Thong, to Commissariat a l'Energie Atomique; and Stein Industri. Heat exchanger whose hot end has a device for protecting the tube plate. 4,418,748., Cl. 165-134.00R.

Poundstone, William W. Method of forming multifocal lens blank. 4,419,119., Cl. 65-39.000.

Povh, Dusan: *See*—
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,419,621., Cl. 324-51.000.

Powell, Stuart A., to P.V. Machining, Inc. Method and apparatus for reducing and classifying mineral crystalline and brittle noncrystalline material. 4,418,871., Cl. 241-1.000.

Poweray Infrared Corporation: *See*—
Heller, Anton H., 4,418,682., Cl. 126-343.50A.

PPG Industries, Inc.: *See*—
Lucas, Joseph P., 4,419,468., Cl. 523-426.000.
Piccirilli, Robert M.; Chang, Wen-Hsuan; Porter, Samuel, Jr.; O'Dwyer, James B.; and Lee, Kyu-Wang, 4,419,407., Cl. 428-423.100.
Valimont, James L.; and Kelly, Joseph D., 4,419,176., Cl. 156-556.000.
Wismer, Marco; and Bosso, Joseph F., 4,419,467., Cl. 523-414.000.

Praefcke, Klaus; Schmidt, Dietmar; and Eidenschink, Rudolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystalline cyclohexylcarbonitrile derivatives. 4,419,263., Cl. 252-299.630.

Prange, Charles J., to Sewer Rodding Equipment Co. Sewer pipe tester. 4,418,572., Cl. 73-432.00R.

Prasad, Arun, to Jeneric Industries, Inc. Dental alloys for porcelain-fused-to-metal restorations. 4,419,325., Cl. 420-464.000.

Pratt-Read Corporation: *See*—
Tollefsen, Kjell T.; and Nordquist, Albert W., 4,418,605., Cl. 84-434.000.

Pratt, Roy E.: *See*—
Castagnos, Leonce F., Jr.; and Pratt, Roy E., 4,419,221., Cl. 208-113.000.

Precision Golf Design, Inc.: *See*—
May, Brian E., 4,419,655., Cl. 340-323.00R.

Precision Valve Corporation: *See*—
Di Loreto, Joseph, 4,418,842., Cl. 222-153.000.

Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: *See*—
Bauer, Karl-Heinz; Eckert, Gerold; and Labude, Wolfgang, 4,419,639., Cl. 334-7.000.

Preisenhammer, Peter: *See*—
Zimmermann, Hanns; and Preisenhammer, Peter, 4,418,899., Cl. 269-32.000.

Prescher, Gunther: *See*—
Wolfgang, Bergstein; Friedrich, Heinz; Kloemann, Axel; Prescher, Gunther; and Beschke, Helmut, 4,419,272., Cl. 502-84.000.

Press-A-Lite Corporation: *See*—
Chabria, Paul R., 4,419,718., Cl. 362-205.000.

Price, Edison A.; and Bengochea, Fulgencio, to Edison Price, Incorporated. Ceiling supported lighting fixtures. 4,419,717., Cl. 362-148.000.

Price, Leonard W., to Hughes Helicopters, Inc. Single barrel externally powdered gun. 4,418,607., Cl. 89-33.0CA.

Priebe, Edmund: *See*—
Brandstetter, Franz; Echte, Adolf; Naarmann, Herbert; and Priebe, Edmund, 4,419,478., Cl. 524-318.000.

Process Engineering Company SA: *See*—
Kretz, Rolf H., 4,419,448., Cl. 435-161.000.

Procter & Gamble Company, The: *See*—
Seward, Larry O.; and Warman, Bradley, 4,419,377., Cl. 426-554.000.

Proctor & Schwartz, Inc.: *See*—
George, Kurudamannil A., 4,418,856., Cl. 226-118.000.

Prost, Jean-Louis: *See*—
Arieh, Simon; Courvoisier, Guy; and Prost, Jean-Louis, 4,418,577., Cl. 73-772.000.

Pruski, John A.: *See*—
Lenzini, Albert A.; Swanson, Robert C.; Roberts, James T.; and Pruski, John A., 4,418,976., Cl. 339-91.00R.

Pryor, Michael J.; Tyler, Derek E.; and Yarwood, John C., to Olin Corporation. Process for electromagnetically casting or reforming strip materials. 4,419,177., Cl. 156-601.000.

PTX-Pentronix, Inc.: *See*—
DeSantis, Raymond P., 4,418,501., Cl. 51-157.000.

Puffett, Alan W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Apparatus for estimating slant visibility in fog. 4,419,731., Cl. 364-428.000.

Puletti, Paul P.; and Stubler, Catherine E., to National Starch and Chemical Corporation. Heat resistant hot melt adhesives. 4,419,494., Cl. 525-95.000.

Purdy, Kenneth R.: *See*—
Bowen, Mack D.; and Purdy, Kenneth R., 4,419,185., Cl. 201-4.000.

Purvis, James E. Boiler structure. 4,418,649., Cl. 122-15.000.

Puskas, Jeffery A.; Skerlos, Peter C.; and Zato, Thomas J., to Zenith Radio Corporation. Character generator with latched outputs. 4,419,662., Cl. 340-750.000.

Puskas, Tivadar: *See*—
Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezso; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, 4,419,524., Cl. 562-506.000.

Quadco Component Systems, Inc.: *See*—
Shubow, Calvin; and Skinner, Robert V., 4,419,133., Cl. 106-85.000.

Quantum Corporation: *See*—
Harrison, Joel N.; Daniels, Donald V.; and Peterson, Bruce R., 4,419,701., Cl. 360-77.000.

Quantz, James B., to Machine Design Incorporated. Apparatus for cracking nuts at high production rates. 4,418,617., Cl. 99-571.000.

Quash, Gerard A., to Institut National de la Sante et de la Recherche Medicale-INSERM. Novel supports carrying side chains, processes for obtaining these supports, process for attaching organic compounds having carbohydrate residues one said supports, products and reagents resulting from said chemical fixation. 4,419,444., Cl. 435-7.000.

Raasch, Hans, to W. Schlafhorst & Co. Double-sided open end spinning machine. 4,418,525., Cl. 57-264.000.

Rabe, William T.; and Roberts, Maurice P., to TRW Inc. Steering apparatus. 4,418,781., Cl. 180-155.000.

Rabinovich, Eliezer M.: *See*—
Johnson, David W., Jr.; MacChesney, John B.; and Rabinovich, Eliezer M., 4,419,115., Cl. 65-3.120.

Racek, Alfred. Gas lighter. 4,419,073., Cl. 431-344.000.

Raden, Daniel S.: *See*—
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,419,461., Cl. 521-126.000.

Radman, Anton J.; Bauck, Randall C.; and Kleczkowski, Peter S., to Iomega Corporation. Bernoulli plate for stabilization of flexible magnetic disk. 4,419,704., Cl. 360-102.000.

Raff, Lothar: *See*—
Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; Raff, Lothar; Rieger, Franz; and Wiedenmann, Hans-Martin, 4,419,190., Cl. 204-1.00T.

Ragen Precision Industries, Inc.: *See*—
Barto, Robert M., Jr.; and Lopata, Ira, 4,418,643., Cl. 118-657.000.

Ragle, Herbert U.; and Blessum, Norman S., to Burroughs Corporation. Dual-track spiral recording and associated system. 4,419,700., Cl. 360-77.000.

Rahman, Aquilur; and Schein, Philip S., to Georgetown University. Anthracycline glycoside compositions, their use and preparation. 4,419,348., Cl. 424-180.000.

Raines, Charles D., to Horton Industries, Inc. Friction interface unit for a clutch and a brake. 4,418,807., Cl. 192-18.00A.

Raos, Robert R.: *See*—
DiGiacomo, Hector; Raos, Robert R.; and Zabko, Al L., 4,418,464., Cl. 29-564.600.

Rapp, Willard E., to Western Electric Co. Wire cutting and insulation softening apparatus. 4,418,465., Cl. 29-566.100.

Raskin, Gregory D. Electronic signal level control apparatus for acoustical-electrical transducer instrument. 4,418,599., Cl. 381-1.050.

Rasmussen GmbH: *See*—
Sauer, Heinz, 4,418,448., Cl. 24-20.0TT.

Ratkowski, Donald J.; and Lue, Ping-Chang, to Paragon Optical, Inc. Contact lens composition, article and method of manufacture. 4,419,505., Cl. 526-279.000.

Raue, Roderich, to Bayer Aktiengesellschaft. Process for the preparation of trimethine dyestuffs. 4,419,511., Cl. 542-471.000.

Rauer, Werner: *See*—
Ackermann, Jurgen; Moretto, Hans-Heinrich; Kniege, Wilfried; and Rauer, Werner, 4,419,474., Cl. 524-195.000.

Rausch, Werner: *See*—
Hauffe, Dieter; Muller, Gerhard; Rausch, Werner; and Volling, Gudrun, 4,419,199., Cl. 204-181.00R.

Rayburn, Sam E. Fishing float. 4,418,492., Cl. 43-44.900.

Raychem Corporation: *See*—
Diaz, Stephen H.; and Horsma, David A., 4,419,156., Cl. 156-49.000.

RCA Corporation: *See*—
Christopher, Todd J.; and Dieterich, Charles B., 4,419,699., Cl. 358-340.000.
Dholakia, Anil R.; and Ruggeri, Vincent J., 4,418,500., Cl. 51-125.500.
Dischert, Robert A.; and Oakley, Charles B., 4,419,687., Cl. 358-13.000.
Hicks, James E., 4,419,608., Cl. 315-408.000.
Stewart, Roger G.; and Mazin, Moshe, 4,419,741., Cl. 365-72.000.
White, Allan E., 4,418,576., Cl. 73-61.300.

Reber, Harald: *See*—
Dietz, Hermann; Holfelder, Gerhard; Muller, Klaus; and Reber, Harald, 4,419,212., Cl. 204-424.000.

Reck, Richard A.: *See*—
Richmond, James M.; Reck, Richard A.; and Bernard, Gary A., 4,419,140., Cl. 106-273.00N.

Reczek, James A.; and Elwood, James K., to Eastman Kodak Company. Photographic products and processes employing 6-heterocyclylazo-3-pyridinol nondiffusible cyan dye-releasing compounds and precursors thereof. 4,419,435., Cl. 430-223.000.

Reda, Kazimierz J.; Dzewaltowski, Victor F.; and Gile, Richard H., to Ex-Cell-O Corporation. Single workhead electro-mechanical internal grinding machine with grinding spindle directly on cross slide. 4,419,612., Cl. 318-571.000.

Reed, Clayton L.: *See*—
Miller, John D.; and Reed, Clayton L., 4,419,234., Cl. 210-232.000.

Reed, Floyd W. Cotton module transport processes. 4,419,042., Cl. 414-786.000.

Reeh, Ulrike: *See*—
Lang, Josef; Hollaus, Reinhard; Reeh, Ulrike; Denk, Hans; and Habrich, Reiner, 4,419,531., Cl. 136-251.000.

Rees, Karl, to Sulzer Brothers Limited. Steam generator having a superheater tube bank. 4,418,652., Cl. 122-468.000.

Reetz, Manfred T.; and Chatziiosifidis, Ioannis, to Bayer Aktiengesellschaft. Preparation of tertiary alkyl cyanides. 4,419,296., Cl. 260-464.000.

Regal International, Inc.: *See*—
Springer, Virgil E., 4,419,479., Cl. 524-413.000.

Regal Ware, Inc.: *See*—
Heermans, Thomas W., 4,418,637., Cl. 116-70.000.

Rehn, Irwin M.: *See*—
Apblett, William R., Jr.; and Rehn, Irwin M., 4,419,144., Cl. 148-6.200.

Reich Spezialmaschinen GmbH: *See*—
Dettelbach, Alfred; and Henzler, Roland, 4,418,640., Cl. 118-411.000.

Reichert, Gunter: *See*—
Niermann, Hermann; Reichert, Gunter; Ebert, Hans; and Neumann, Friedrich, 4,419,104., Cl. 23-293.00R.

Reiff, Helmut F.: *See*—
Hudson, George A., deceased; and Reiff, Helmut F., 4,419,293., Cl. 260-453.0AB.

Reiji, Oguma; and Akihiro, Hirai, to Toshiba Ceramics Co., Ltd. Quartz glass and a process for making same. 4,419,118., Cl. 65-18.200.

Reilly, Eugene P.: *See*—
Borman, Willem F. H.; Kramer, Morton; and Reilly, Eugene P., 4,419,485., Cl. 525-437.000.

Reindel, John, to United States of America, Navy. Slotline reverse-phased hybrid ring coupler. 4,419,635., Cl. 333-116.000.

Reinecke, Erich, to WABCO Fahrzeugbremsen GmbH. Load-controlled brake pressure control unit. 4,418,965., Cl. 303-22.00R.

Reinehr, Dieter: *See*—
Falk, Robert A.; Borsodi, Istvan; and Reinehr, Dieter, 4,419,298., Cl. 260-501.160.

Reiner, Richard W., to United States of America, Air Force. Analog or gate circuit. 4,419,595., Cl. 307-355.000.

Reitz, Ronald P. Thermally electrogenerative storage cell and generator apparatus. 4,419,617., Cl. 322-2.00R.

Relle, Somfai: *See*—
Elekes, Ilona; Institoris, Laszlo; Medzihradsz, Kalman; Otvos, Laszlo; Medzihradszky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522., Cl. 549-557.000.

Rembold, Manfred: *See*—
Berner, Godwin; Rembold, Manfred; and Rody, Jean, 4,419,472., Cl. 524-102.000.

Renz, Klaus: *See*—
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,419,621., Cl. 324-51.000.

REPA Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,418,878., Cl. 242-107.300.

Research Corporation: *See*—
Rosenberg, Barnett; Van Camp, Loretta; Ficher, Robert G.; Kansy, Samir; Peresie, Henry J.; and Davidson, James P., 4,419,351., Cl. 424-245.000.

Reul, Joseph A.: *See*—
Allen, Edwin; Dillarstone, Alan; and Reul, Joseph A., 4,419,250., Cl. 252-8.600.

Reus, Josef; Wewer, Hans; and Jurgen, Hofmann, to Nukem GmbH. Process for removal of nitrogen oxides. 4,419,333., Cl. 423-235.000.

Reuter, Herbert; Saran, Herbert, deceased (by Muller, Karin Saran nee, heiress); and Witthaus, Martin, to Henkel Kommanditgesellschaft Auf Aktien. Method for the production of a suds-stabilized silicone-containing detergent. 4,419,260., Cl. 252-174.130.

Rexar Industries, Inc.: *See*—
Rowland, Floyd C., 4,419,097., Cl. 604-174.000.

Rexham Corporation: *See*—
Johnson, Kenneth R., 4,418,512., Cl. 53-434.000.
Plahm, Jack E., 4,418,513., Cl. 53-434.000.

Rexnord Inc.: *See*—
Martin, Donald E.; and Petershack, Victor D., 4,418,817., Cl. 198-845.000.

Reyes, Jaime M.: *See*—
Czubatyj, Wolodymyr; Singh, Rajendra; Doehler, Joachim; Allred, David D.; and Reyes, Jaime M., 4,419,533., Cl. 136-259.000.

Reynolds Metals Company: *See*—
Kibby, Robert M., 4,419,126., Cl. 75-10.00R.

Reynolds, Virgil C., Jr.; and Cerny, Daryl D., to Ball Corporation. Preform structure. 4,419,319., Cl. 264-292.000.

Rheinmetall GmbH: *See*—
Klumpp, Walter, 4,418,608., Cl. 89-193.000.

Rhone-Poulenc Industries: *See*—
Breant, Claude, 4,419,281., Cl. 252-522.00R.
Breant, Claude, 4,419,282., Cl. 252-522.00R.
Debarre, Francois; Fabre, Jean-Louis; Farge, Daniel; and James, Claude, 4,419,356., Cl. 424-251.000.

Rice, Edward K. Expansive cement. 4,419,136., Cl. 106-89.000.

Richmond, James M.; Reck, Richard A.; and Bernard, Gary A., to Akzona Incorporated. Alkoxylated diquaternary ammonium compounds. 4,419,140., Cl. 106-273.00N.

Richter Gedeon Vegyeszeti Gyar RT: *See*—
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.

Richter, Gerhard: *See*—
Andre, Pierre A.; Thevenin, Jean-Claude P. H. P.; Girault, Jean-Pierre Y. B.; and Richter, Gerhard, 4,419,045., Cl. 415-119.000.

Ricke, Theodore D. Corpse positioning system. 4,418,900., Cl. 269-45.000.

Ricks, Michael J.: *See*—
McKendry, Lennon H.; Ricks, Michael J.; and Rogers, Richard B., 4,419,514., Cl. 544-334.000.

Ricoh Company, Ltd.: *See*—
Ebi, Yutaka; and Mizuno, Akinori, 4,419,673., Cl. 346-75.000.
Fujimoto, Sakae, 4,418,904., Cl. 271-37.000.
Wada, Yoshinori, 4,419,697., Cl. 358-257.000.

Riechert, Klaus-Dieter: *See*—
Theisen, Peter; and Riechert, Klaus-Dieter, 4,418,704., Cl. 128-785.000.

Riedel-de Haen Aktiengesellschaft: *See*—
Steinmetz, Arthur, 4,419,529., Cl. 568-772.000.

Rieger, Franz: *See*—
Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; Raff, Lothar; Rieger, Franz; and Wiedenmann, Hans-Martin, 4,419,190., Cl. 204-1.00T.
Muller, Klaus; Rieger, Franz; and Linder, Ernst, 4,418,672., Cl. 123-478.000.

Riehl, Fred, to Robertshaw Controls Company. Tubular burner construction and method of making the same. 4,418,456., Cl. 29-157.00C.

Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, to Chemische Werke Huls AG. Fire retardant fine particulate expandable styrene polymers. 4,419,458., Cl. 521-56.000.

Riley, Donald J.; and Scott, John W., to Sprague Electric Company. Degreasing and deoxidizing aluminum foil. 4,419,259., Cl. 252-142.000.

Rink, Norbert: *See*—
Muschelknautz, Edgar; and Rink, Norbert, 4,419,117., Cl. 65-16.000.

Rinzai Co., Ltd.: *See*—
Fujita, Minoru; and Nishida, Shigeo (said Shigeo Nishida assors. to), 4,418,483., Cl. 36-28.000.

Ripka, William C.: *See*—
Brittelli, David R.; and Ripka, William C., 4,419,517., Cl. 546-144.000.

Rittmann, Udo, to Clark Equipment Company. Transmission and disc brake. 4,418,796., Cl. 188-71.500.

Ritz, Alan J.: *See*—
Pilachowski, Martin T.; and Ritz, Alan J., 4,419,048., Cl. 415-196.000.

Rizhsky Meditsinsky Institut: *See*—
Kolesnik, Anatoly G.; Kadnikova, Galina I.; Morozova, Lilia V.; and Boginskaya, Lidia M., 4,419,341., Cl. 424-52.000.

Rosdrunner Electronic Products Limited: *See*—
Brine, Terence J., 4,418,875., Cl. 242-7.060.

Robert Bosch GmbH: *See*—
Boning, Bernward; Nagel, Rudolf; Honig, Gunter; Kiencke, Uwe; and Theuerkauf, Heinz, 4,418,567., Cl. 73-35.000.
Dietz, Hermann; Grob, Ferdinand; Muller, Klaus; Raff, Lothar; Rieger, Franz; and Wiedenmann, Hans-Martin, 4,419,190., Cl. 204-1.00T.
Dietz, Hermann; Holfelder, Gerhard; Muller, Klaus; and Reber, Harald, 4,419,212., Cl. 204-424.000.
Djordjevic, Ilija, 4,418,667., Cl. 123-387.000.
Eggert, Albert; Gahleitner, Erwin; and Kwiatkowski, Joachim, 4,418,787., Cl. 181-130.000.
Esper, Friedrich; Frey, Thomas; Geier, Heinz; Holfelder, Gerhard; and Knoll, Gunther, 4,418,661., Cl. 123-145.00A.
Gretsch, Ralf, 4,419,618., Cl. 322-7.000.
Muller, Klaus; Rieger, Franz; and Linder, Ernst, 4,418,672., Cl. 123-478.000.

Roberts, Clark S.: *See*—
Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., 4,418,507., Cl. 52-241.000.

Roberts, Daniel F. T., to International Standard Electric Corporation. Solder flux compositions. 4,419,146., Cl. 148-23.000.

Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R. Interior wall system. 4,418,507., Cl. 52-241.000.

Roberts, James T.: *See*—
Lenzini, Albert A.; Swanson, Robert C.; Roberts, James T.; and Pruski, John A., 4,418,976., Cl. 339-91.00R.

Roberts, Maurice P.: *See*—
Rabe, William T.; and Roberts, Maurice P., 4,418,781., Cl. 180-155.000.

Roberts, Richard A.: *See*—
Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., 4,418,507., Cl. 52-241.000.

Roberts, W. Calvin: *See*—
Roberts, Frank W.; Roberts, Richard A.; Roberts, W. Calvin; Nipko, Jack A.; Roberts, Clark S.; and Hudson, Hal R., 4,418,507., Cl. 52-241.000.

Robertshaw Controls Company: *See*—
Riehl, Fred, 4,418,456., Cl. 29-157.00C.

Rockwell International Corporation: *See*—
Friefeld, Jerome M.; and Friedman, Joseph, 4,418,683., Cl. 126-400.000.
Phillips, Donald E., 4,419,633., Cl. 331-17.000.
Soclof, Sidney I., 4,419,150., Cl. 148-187.000.
Stamm, Johann A., 4,419,052., Cl. 416-214.00A.

Rode, Daniel L. Continuous ribbon epitaxy. 4,419,178., Cl. 156-610.000.

Rody, Jean: *See*—
Berner, Godwin; Rembold, Manfred; and Rody, Jean, 4,419,472., Cl. 524-102.000.

Roehr, Oskar W. K. Apparatus for heating persons travelling in or on open vehicles having internal combustion engines. 4,418,745., Cl. 165-46.000.

Rogers, Richard B.: *See*—
McKendry, Lennon H.; Ricks, Michael J.; and Rogers, Richard B., 4,419,514., Cl. 544-334.000.

Rogers, Walter C., Jr., to Parma Corporation. Reclining chair with improved actuation. 4,418,957., Cl. 297-85.000.

Rohm, Gunter H. Nonloosening drill chuck. 4,418,926., Cl. 279-62.000.

Rohm, Gunter H. Lockable drill chuck. 4,418,927., Cl. 279-62.000.

Rohm and Haas Company: *See*—
Barrett, James H.; Howell, Thomas J.; and Lein, George M., Jr., 4,419,245., Cl. 210-681.000.
Myers, Robert M., 4,419,277., Cl. 252-500.000.
Smolanoff, Joel R., 4,419,360., Cl. 424-258.000.
Swithenbank, Colin, 4,419,122., Cl. 71-98.000.
Swithenbank, Colin, 4,419,123., Cl. 71-98.000.
Swithenbank, Colin, 4,419,124., Cl. 71-98.000.

Roland, Billy F. Knock down chair. 4,419,028., Cl. 403-353.000.

Roldan, Bayani E., to Bell & Howell Company. Method and apparatus for storing a length of web. 4,418,874., Cl. 242-.3G..

Rolls-Royce Limited: *See*—
Barry, Brian; Sadler, John H. R.; Allen, Susan M.; and Artt, David W., 4,419,044., Cl. 415-117.000.
Pellow, Terrence R., 4,418,528., Cl. 60-39.161.

Romer, Michael: *See*—
Eidenschink, Rudolf; Romer, Michael; and Pohl, Ludwig, 4,419,264., Cl. 252-299.630.

Romick, Jerome M. Medication handling system and reusable dispensing container. 4,418,823., Cl. 206-538.000.

Rosaen, Borje O. Fluid filtering device. 4,419,240., Cl. 210-444.000.

Rosdy, Bela: *See*—
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galamboss, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.

Rose, Edward, to Peters Machinery Company, Subsidiary of Katy Industries, Inc. Finger cookie orienting apparatus. 4,418,814., Cl. 198-406.000.

Rose, John B., to Imperial Chemical Industries PLC. Sulphonated polyaryletherketones. 4,419,486., Cl. 525-534.000.

Rose, Peter W. Apparatus for preparing meat food products having reduced shrinkage. 4,419,205., Cl. 204-228.000.

Rose, Stanley E. Spacial mechanism and method. 4,419,041., Cl. 414-739.000.

Rosenberg, Barnett; Van Camp, Loretta; Ficher, Robert G.; Kansy, Samir; Peresie, Henry J.; and Davidson, James P., to Research Corporation. Platinum-dioxopyrimidine complexes. 4,419,351., Cl. 424-245.000.

Ross, Charles W., to Leeds & Northrup Company. Time deviation and inadvertent interchange correction for automatic generation control. 4,419,733., Cl. 364-493.000.

Ross, James W. Multi-stage electrical control system. 4,419,589., Cl. 307-39.000.

Rosselet, Jean, to Mefina S.A. Mechanism for a rotating projectile fuze. 4,418,621., Cl. 102-238.000.

Roth, Christoph: *See*—
Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, 4,419,440., Cl. 430-377.000.

Roth, Martin; and Kiendl, Helmut, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. System for releasably securing movable support elements on space vehicles. 4,419,033., Cl. 410-32.000.

Rothmans of Pall Mall Canada Limited: *See*—
Schmelzer, Juergen F., 4,419,627., Cl. 328-4.000.

Rottmaier, Ludwig; and Merten, Rudolf, to Bayer Aktiengesellschaft. Hydroxyalkyl- and alkoxyalkyl-triazolidine-3,5-dione compounds and their processes for their preparation. 4,419,520., Cl. 548-264.000.

Rowe, Eugene H., to B. F. Goodrich Company, The. Toughened polyester resins. 4,419,487., Cl. 525-38.000.

Rowland, Floyd C., to Rexar Industries, Inc. Attachment for catheter tube. 4,419,097., Cl. 604-174.000.

Roydhouse, Richard H. Mercury filtering apparatus and method. 4,419,107., Cl. 55-5.000.

Rubber and Plastics Research Association of Great Britain: *See*—
Gale, George M., 4,419,014., Cl. 366-99.000.

Rubio Salas, Roque. Device for controlling the cation saturation in interchanging filters. 4,419,229., Cl. 210-85.000.

Rubricius, Jeanette L.: *See*—
LeVeen, Eric G.; LeVeen, Robert F.; and Rubricius, Jeanette L., 4,418,693., Cl. 128-303.00R.

Rudle, Manfred: *See*—
Stoll, Kurt; and Rudle, Manfred, 4,418,711., Cl. 137-269.000.

Ruggeri, Vincent J.: *See*—
Dholakia, Anil R.; and Ruggeri, Vincent J., 4,418,500., Cl. 51-125.500.

Rule, Charles E., to SCM Corporation. Cream/alcohol-containing beverages. 4,419,378., Cl. 426-592.000.

Ruspino, James G.: *See*—
Gurubatham, Vincent P.; and Ruspino, James G., 4,418,868., Cl. 239-228.000.

Russell, Gilbert E.; and Wong, Hee, to National Semiconductor Corporation. Digital color modulator. 4,419,689., Cl. 358-37.000.

Russell, Thomas D., to Babcock & Wilcox Company, The. Boiler loading system. 4,418,541., Cl. 60-667.000.

Ruth, Charles N. Method and apparatus for separating a lid from a container. 4,418,460., Cl. 29-403.300.

Rutherford, Sherman L.; Bliss, Arthur E.; and Schmidt, Noel J., to Benson, Inc. Guadrascan styli for use in staggered recording head. 4,419,679., Cl. 346-155.000.
Rutter, Phillip, to Plessey Overseas Limited. Non-volatile static ram element. 4,419,744., Cl. 365-154.000.
Ryan, James J., Jr. Baseball/softball cart. 4,418,930., Cl. 280-47.190.
Ryan, Raymond W.: *See*—
Noonan, John M.; Ryan, Raymond W.; and Houle, James F., 4,419,437., Cl. 430-270.000.
SAB Industri AB: *See*—
Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., 4,418,801., Cl. 188-202.000.
Sadler, John H. R.: *See*—
Barry, Brian; Sadler, John H. R.; Allen, Susan M.; and Artt, David W., 4,419,044., Cl. 415-117.000.
Saeki, Yukio; and Inoue, Naomitsu, to Sumitomo Durez Company, Ltd. Powder phenolic resin composition for dry process resin-bonded felt. 4,419,477., Cl. 524-290.000.
Safinco: *See*—
De Lathauwer, Rene; Van Opstal, Martin; and Dijkstra, Albert J., 4,419,291., Cl. 260-410.700.
Saint E. Company, Inc., The: *See*—
Clark, Robert W., Jr., 4,418,547., Cl. 62-116.000.
St. John, Peter A., to Baxter Travenol Laboratories, Inc. Ultrasonic bubble detector. 4,418,565., Cl. 73-19.000.
Saito, Harumitsu: *See*—
Ishihara, Hideo; Ohshita, Takahiro; and Saito, Harumitsu, 4,419,330., Cl. 422-143.000.
Saito, Mitsuo: *See*—
Yamashita, Sadahiko; and Saito, Mitsuo, 4,419,768., Cl. 455-180.000.
Saito, Takashi; Tajima, Osamu; and Mochizuki, Masafumi, to Victor Company of Japan, Ltd. Case for a disc-shaped recording medium. 4,419,709., Cl. 360-133.000.
Sakabe, Takao: *See*—
Chiba, Yoshiharu; Umezawa, Hidetsugu; Sakabe, Takao; and Arai, Ryuji, 4,418,729., Cl. 139-452.000.
Sakai, Keijiro: *See*—
Muto, Nobuyoshi; Sakai, Keijiro; and Matsuda, Yasuo, 4,419,615., Cl. 318-811.000.
Sakai, Shinji: *See*—
Kawabata, Takashi; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,419,574., Cl. 250-204.000.
Sakai, Yasuharu; Murai, Nobuaki; and Nakano, Kiyotaka, to Japan Storage Battery Company Ltd. Control device for a small press. 4,418,562., Cl. 72-444.000.
Sakai, Yoshio; and Nakamura, Hideo, to Hitachi, Ltd. Semiconductor integrated circuit. 4,419,684., Cl. 357-40.000.
Sakamoto, Junji: *See*—
Kishi, Hiroyasu; Sakamoto, Junji; and Kondou, Sadao, 4,419,541., Cl. 381-7.000.
Sakano, Hajime; Nakai, Fumio; and Tomari, Yukio, to Sumitomo Naugatuck Co., Ltd. Thermoplastic resin composition excellent in color development. 4,419,491., Cl. 525-67.000.
Sakata, Fusao: *See*—
Tanaka, Hiroshi; and Sakata, Fusao, 4,419,181., Cl. 156-640.000.
Sakiguchi, Shigeo: *See*—
Takahashi, Yasuyoshi; Sakiguchi, Shigeo; and Sato, Teruyoshi, 4,419,738., Cl. 364-900.000.
Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,419,710., Cl. 360-133.000.
Sakurai, Takeichi: *See*—
Irokawa, Shoichi; Imai, Koji; Sakurai, Takeichi; and Goto, Kiyoshi, 4,419,591., Cl. 307-45.000.
Sakurai, Tetsuma: *See*—
Sugawara, Yoshitaka; Kamei, Tatsuya; and Sakurai, Tetsuma, 4,419,685., Cl. 357-53.000.
Salnikov, Andrei F.: *See*—
Bodrov, Igor S.; Gudz, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., 4,418,530., Cl. 60-39.181.
Salomon, Georges P. J., to Etablissements Francois Salomon et Fils, S.A. Latching apparatus for use with ski binding. 4,418,937., Cl. 280-613.000.
Salon, Guy: *See*—
Pouderoux, Pierre; Salon, Guy; and Nguyen-Thanh, Thong, 4,418,748., Cl. 165-134.00R.
Sandberg, Kenneth; and Stoub, James, to Formax, Inc. Mold assembly for food patty molding machine. 4,418,446., Cl. 17-32.000.
Sandel, Dan S. Disposable surgical instrument platform and container. 4,418,821., Cl. 206-370.000.
Sanders, William J.; Snyder, Marvin K.; and Harter, James W., to Butler Manufacturing Company. Roof aperture system for selective collection and control of solar energy for building heating, cooling and daylighting. 4,418,684., Cl. 126-419.000.
Sandoz, Inc.: *See*—
Brand, Leonard J.; and Nadelson, Jeffrey, 4,419,353., Cl. 424-248.400.
Sangamo Weston, Inc.: *See*—
Gurr, George P.; and Nelson, Bruce J., 4,419,665., Cl. 340-825.060.
Gurr, George P.; and Nelson, Bruce J., 4,419,666., Cl. 340-825.060.
Gurr, George P.; and Nelson, Bruce J., 4,419,667., Cl. 340-825.060.
Sangamo Weston Limited: *See*—
Dorey, Howard A., 4,419,758., Cl. 375-38.000.
Sankar, Thiagas S.: *See*—
Warner, Glenfield, 4,418,700., Cl. 128-694.000.
Sankin Industry Co., Ltd.: *See*—
Nakagawa, Katsuyuki; and Oda, Naoki, 4,419,072., Cl. 431-266.000.
Sano, Yoshimoto: *See*—
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Sano, Yoshimoto; Shibukawa, Nobuyuki; and Hashimoto, Takashi, 4,419,349., Cl. 424-195.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Taguchi, Michihiro, 4,419,083., Cl. 440-56.000.
Santa, Richard E. Baseball glove former & carrier. 4,418,849., Cl. 223-78.000.
Santilli, Donald S.; and Blakely, Donald W., deceased (by Jacobson, Robert L., administrator), to Chevron Research Company. Clay-based sulfur sorbent. 4,419,273., Cl. 502-80.000.
Santini, Thomas F., to De Laire, Inc. Vapor dispersing process. 4,419,326., Cl. 422-4.000.
Santucci, Nicola, to Nuovo Pignone S.p.A. Weft insertion devices on looms having a motionless weft reserve. 4,418,727., Cl. 139-448.000.
Sanyo Electric Co., Ltd.: *See*—
Kishi, Hiroyasu; Sakamoto, Junji; and Kondou, Sadao, 4,419,541., Cl. 381-7.000.
Okuyama, Yasuhiko; and Takezono, Takashi, 4,419,017., Cl. 368-64.000.
Sappsucker, Inc.: *See*—
May, Ronald L.; and Snow, Nicholas J., Jr., 4,419,114., Cl. 62-17.000.
Saran, Herbert, deceased: *See*—
Reuter, Herbert; Saran, Herbert, deceased; and Witthaus, Martin, 4,419,260., Cl. 252-174.130.
Sarges, Reinhard, to Pfizer Inc. 6-Halo-4-chromanamines useful as intermediates to make chiral hydantoins. 4,419,521., Cl. 549-404.000.
Sartorius GmbH: *See*—
Hoffmann, Jurgen, 4,419,241., Cl. 210-493.500.
Sarver, Nava: *See*—
Howley, Peter M.; Sarver, Nava; and Law, Ming-Fan, 4,419,446., Cl. 435-68.000.
Sasaki, Yutaka; Mori, Kunio; Moriya, Kiyoshi; and Utsumi, Hiroshi, to Nitto Chemical Industry Co., Ltd. Process for regenerating antimony containing oxide catalyst comprising an aqueous ammonia impregnation. 4,419,267., Cl. 502-26.000.
Sasser, Thurman: *See*—
Bellar, Dennis; and Sasser, Thurman, 4,418,996., Cl. 353-33.000.
Satake, Yasuo: *See*—
Kojima, Takuhito; Satake, Yasuo; and Masuda, Toru, 4,419,753., Cl. 370-62.000.
Satchell, Fred E.; Cornell, William D.; Uitz, Mark O.; and Walker, Clarence L., to Sherwood Medical Company. Pipettor mechanism and disposable tip and piston assembly. 4,418,580., Cl. 73-864.130.
Sato, Akira: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; and Ozaki, Tsuyoshi, 4,419,128., Cl. 75-46.000.
Sato, Michio; Kasai, Shin; and Kawaguchi, Yutaka, to Nitto Boseki Co., Ltd. Method of winding a strand of relatively rigid glass fiber onto a rotating strand winding sleeve. 4,418,876., Cl. 242-18.00G.
Sato, Norio; and Kamimoto, Shohei, to Nissan Motor Company, Limited. Battery operated forklift with a motor driven power steering system. 4,418,778., Cl. 180-132.000.
Sato, Shosuke: *See*—
Takahashi, Mutsumi; Uwabe, Toshio; Nagase, Toshio; Sato, Shosuke; and Matsuzawa, Hideshi, 4,419,572., Cl. 235-69.000.
Sato, Tadao: *See*—
Ishii, Toshihiko; and Sato, Tadao, 4,419,335., Cl. 423-290.000.
Sato, Teruyoshi: *See*—
Takahashi, Yasuyoshi; Sakiguchi, Shigeo; and Sato, Teruyoshi, 4,419,738., Cl. 364-900.000.
Sato, Yoshiro, to Tohoku Metal Industries, Ltd. Transient-noise simulators. 4,419,628., Cl. 328-67.000.
Sattlegger, Hans; Schnurrbusch, Karl; and Achtenberg, Theo, to Bayer Aktiengesellschaft. Organopolysiloxane molding compositions. 4,419,484., Cl. 524-731.000.
Sauer, Heinz, to Rasmussen GmbH. Clamp for hoses or the like. 4,418,448., Cl. 24-20.0TT.
Saurer-Allma GmbH: *See*—
Zimmermann, Hanns; and Preisenhammer, Peter, 4,418,899., Cl. 269-32.000.
Savin Corporation: *See*—
Landa, Benzion, 4,418,903., Cl. 271-10.000.
Sawicki, Robert A.: *See*—
Kaufman, Benjamin J.; Sawicki, Robert A.; and Levine, Stephen A., 4,419,255., Cl. 252-51.50A.
Sawyer, George N., to Trane CAC, Inc. Variable capacity multiple compressor refrigeration system. 4,418,548., Cl. 62-175.000.
Schaffer, Clarence S. Spoked wheel covers. 4,418,962., Cl. 301-37.00P.
Scheepswerf en Machinefabriek "De Liesbosch" B.V.: *See*—
Wolters, Tjako A.; Goedegebuure, Gerard W. H.; de Witt, Bartholomeus M.; and Veltman, Constantius H. M., 4,418,484., Cl. 37-63.000.
Schein, Philip S.: *See*—
Rahman, Aquilur; and Schein, Philip S., 4,419,348., Cl. 424-180.000.
Scheinpflug, ans: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, ans, 4,419,361., Cl. 424-273.00R.
Schell, Joseph G., Jr., to Dow Chemical Company, The. Transition metal containing catalyst. 4,419,269., Cl. 502-169.000.

Schellenberg, Walter. Container closure and a frangible inner closure. 4,418,831., Cl. 220-258.000.

Schepakin, Mikhail B.: *See*—
Bodrov, Igor S.; Gudz, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., 4,418,530., Cl. 60-39.181.

Schering Aktiengesellschaft: *See*—
Dahms, Wolfgang, 4,419,192., Cl. 204-15.000.

Schimmel, Vernon R., to Symons Corporation. Double-hinge corner for a concrete forming structure. 4,418,884., Cl. 249-11.000.

Schlecht, Karl. Concrete pump tractor trailer assembly. 4,418,713., Cl. 137-351.000.

Schlier, Robert E.: *See*—
Janes, George S.; and Schlier, Robert E., 4,419,582., Cl. 250-424.000.

Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J. Precooler for gas turbines. 4,418,527., Cl. 60-39.050.

Schlumberger Technology Corporation: *See*—
Sinha, Bikash K., 4,419,600., Cl. 310-361.000.

Schmelzer, Juergen F., to Rothmans of Pall Mall Canada Limited. Measuring the moisture content of materials. 4,419,627., Cl. 328-4.000.

Schmidt, Dietmar: *See*—
Praefcke, Klaus; Schmidt, Dietmar; and Eidenschink, Rudolf, 4,419,263., Cl. 252-299.630.

Schmidt, Noel J.: *See*—
Rutherford, Sherman L.; Bliss, Arthur E.; and Schmidt, Noel J., 4,419,679., Cl. 346-155.000.

Schmitt, Wayne I.: *See*—
Bradley, Leonard R.; Schmitt, Wayne I.; and Macedo, Antone F., Jr., 4,418,804., Cl. 190-18.00A.

Schmitz, Albert, to U.S. Philips Corporation. Zener diode. 4,419,681., Cl. 357-13.000.

Schmitz, George J.: *See*—
Dzung, John C.; Perkey, Harry J.; and Schmitz, George J., 4,418,830., Cl. 220-81.00R.

Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, to Chemplex Company. Composite structures. 4,419,408., Cl. 428-424.400.

Schnee, Edward A.: *See*—
Frew, Duncan W.; Stefanini, Zorro; Schnee, Edward A.; and di Ricco, Leo, 4,419,257., Cl. 252-62.540.

Schneider, Helmut, to Inkares AG. Container which can be opened with one hand. 4,418,832., Cl. 220-260.000.

Schneider, Ronald A. Liquid compositions for display devices. 4,419,283., Cl. 252-600.000.

Schneider, Rudolf; and Husch, Bruno, to Busatis-Werke GmbH u.Co K.G. Boge GmbH. Thrust swivel bearing on mowing knives supported in swinging levers of mower cutting systems. 4,418,520., Cl. 56-297.000.

Schnurrbusch, Karl: *See*—
Sattlegger, Hans; Schnurrbusch, Karl; and Achtenberg, Theo, 4,419,484., Cl. 524-731.000.

Scholz, Manfred: *See*—
Fricker, Wolfgang-Peter; and Scholz, Manfred, 4,418,724., Cl. 138-149.000.

Schottel-Werft Josef Becker GmbH & Co KG: *See*—
Krautkremer, Franz; and Lais, Siegfried, 4,419,082., Cl. 440-42.000.

Schottel-Werft, Josef Becker GmbH & Co. KG: *See*—
Krautkremer, Franz; and Issleib, Juergen, 4,418,633., Cl. 114-144.00E.

Schroeter, Siegfried H.: *See*—
Ashby, Bruce A.; and Schroeter, Siegfried H., 4,419,405., Cl. 428-412.000.

Schrotz, Kurt: *See*—
Becker, Werner; Kistner, Heinz; and Schrotz, Kurt, 4,419,171., Cl. 156-384.000.

Schuch, Gerhard: *See*—
Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,419,621., Cl. 324-51.000.

Schuetz, Mark A., to Advanced Mechanical Technology, Inc. High efficiency gas burner. 4,419,074., Cl. 431-354.000.

Schultz, Steven C.; and Vaughn, Thomas A., to Nichols-Homeshield, Inc. Rotary latch for screen door. 4,418,951., Cl. 292-202.000.

Schulze, Carsten; Lotter, Kurt; and Malefakis, Jakob, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Two-dimensional, unilateral oblique shock diffuser as the air inlet for a gas turbine jet engine for the propulsion of heavy-duty aircraft. 4,418,708., Cl. 137-15.200.

Schulze, Dietmar: *See*—
Bollinger, Helmut; Bucken, Bernd; Schulze, Dietmar; and Wilberg, Rudiger, 4,419,380., Cl. 427-38.000.

Schumann, Wilhelm: *See*—
Bayer, Ernst; and Schumann, Wilhelm, 4,419,490., Cl. 525-61.000.

Schwartz, James E., to Dow Chemical Company, The. Small particle size latex useful as a pressure sensitive adhesive. 4,419,481., Cl. 524-551.000.

Schwartz, Robert, to John Zink Company. Portable high-flow rate flare for smokeless burning of viscous liquid fuels. 4,419,071., Cl. 431-202.000.

Schweiger, Richard G. Process of making films, fibers or other shaped articles consisting of, or containing, polyhydroxy polymers. 4,419,316., Cl. 264-184.000.

SCM Corporation: *See*—
Rule, Charles E., 4,419,378., Cl. 426-592.000.
Suderman, Darrel R., 4,419,371., Cl. 426-94.000.

Scott, John W.: *See*—
Riley, Donald J.; and Scott, John W., 4,419,259., Cl. 252-142.000.

Scott Paper Company: *See*—
Varona, Eugenio, 4,419,403., Cl. 428-288.000.

Scott, Richard H., to Western Electric Company, Inc. Sheet stock transfer apparatus. 4,418,906., Cl. 271-99.000.

Sealright Co. Inc.: *See*—
Young, Jerry W., 4,418,644., Cl. 118-669.000.

Searle, Richard J.: *See*—
Mancini, Gerardo; Searle, Richard J.; and Davis, Eugene E., 4,418,826., Cl. 215-231.000.

Seeq Technology, Inc.: *See*—
Jordan, Larry T., 4,419,747., Cl. 365-201.000.

Seferiadis, Johann: *See*—
Heybutzki, Helmut; Krug, Wolfgang; and Seferiadis, Johann, 4,418,544., Cl. 62-55.000.

Segal, Mark: *See*—
Dikstein, Shabtay; and Segal, Mark, 4,419,367., Cl. 424-330.000.

Seguin, Herb J. J. Method and apparatus for the protection of electrical equipment from high voltage transients. 4,419,711., Cl. 361-111.000.

Sehm, Eugene J., to B. F. Goodrich Company, The. Polymerization process for carboxyl containing polymers. 4,419,502., Cl. 526-209.000.

Seidel, Horst: *See*—
Magedanz, Norbert; Seidel, Horst; and Weiss, Hans J., 4,419,216., Cl. 208-11.00R.

Seidl, Hans: *See*—
Meyer, Heinz; Dorn, Maximilian; and Seidl, Hans, 4,419,197., Cl. 204-159.200.

Seiko Koki Kabushiki Kaisha: *See*—
Ishida, Hiroaki, 4,418,998., Cl. 354-405.000.

Seipel, Winfried, to Hewlett-Packard Company. Current controlled variable reactor. 4,419,648., Cl. 336-215.000.

Sekine, Hisashi: *See*—
Tachikawa, Kyoji; Sekine, Hisashi; Itoh, Kikuo; and Iijima, Yasuo, 4,419,145., Cl. 148-11.50F.

Semenov, Mikhail K.: *See*—
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,418,749., Cl. 165-139.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,419,381., Cl. 427-39.000.

Semien, George A. Article tray for automobiles. 4,418,626., Cl. 108-8.000.

Seno, Eugene T.: *See*—
Baltz, Richard H.; Wild, Gene M.; and Seno, Eugene T., 4,419,447., Cl. 435-76.000.
Baltz, Richard H.; Kirst, Herbert A.; Wild, Gene M.; and Seno, Eugene T., 4,419,508., Cl. 536-7.100.

Seragnoli, Enzo, to G. D. Societa per Azioni. Method and relative manufacturing machine for simultaneously producing two continuous cigarette rods. 4,418,705., Cl. 131-84.00R.

Serrano, Angel B. Nozzle hood for moulding pipes. 4,418,885., Cl. 249-100.000.

Seshamani, Venkatraman: *See*—
Johnson, Richard C.; Seshamani, Venkatraman; and Egbert, Leigh B., 4,418,650., Cl. 122-4.00D.

Seto, Hiroyoshi: *See*—
Yamamoto, Mitsuo; Namazugoshi, Takeo; and Seto, Hiroyoshi, 4,419,163., Cl. 156-94.000.

Seton Company: *See*—
Cioca, Gheorghe, 4,419,288., Cl. 260-123.700.

Severinsson, Lars M.; Beijbom, Peter; and Martensson, Anders K., to SAB Industri AB. Rail vehicle slack adjuster. 4,418,801., Cl. 188-202.000.

Severns, James G., to United States of America, Navy. Thermophotovoltaic power source. 4,419,532., Cl. 136-253.000.

Seward, Larry O.; and Warman, Bradley, to Procter & Gamble Company, The. Cake mix containing a lipophilic emulsifier system. 4,419,377., Cl. 426-554.000.

Sewer Rodding Equipment Co.: *See*—
Prange, Charles J., 4,418,572., Cl. 73-432.00R.

SGM Co., Inc.: *See*—
Gerboth, Patrick L.; and Jozwiak, Stanley E., Jr., 4,419,049., Cl. 415-206.000.

Shaffer, James D., to Goodway Transport, Inc. Pallet carrier. 4,418,853., Cl. 224-42.410.

Shamir, Amos, to Paramount Die & Machine Products. Fuse plug. 4,418,978., Cl. 339-99.00R.

Shapiro, Richard N. Dual container apparatus. 4,418,819., Cl. 206-216.000.

Sharp Kabushiki Kaisha: *See*—
Takanashi, Hiroshi; and Takahara, Shoichiro, 4,418,987., Cl. 350-337.000.

Shaw, Philip L., to Lindeman (Holdings) Limited. Juice drainer. 4,419,238., Cl. 210-338.000.

Shell Internationale Research Maatschappij B.V.: *See*—
Voetter, Heinz; Van Meurs, Hubrecht C. A.; Darton, Richard C.; and Krishna, Rajamani, 4,419,215., Cl. 208-11.00R.

Shell Oil Company: *See*—
Goodall, Brian L.; and Van Der Sar, Jacob C., 4,419,501., Cl. 526-122.000.

Shepherd, David: *See—*
Maillard, Francois; and Shepherd, David, 4,419,449., Cl. 435-170.000.
Sherbert, Edward G.: *See—*
Branigin, Michael H.; Sherbert, Edward G.; and Krasucki, Joseph F., Jr., 4,419,724., Cl. 364-200.000.
Sheridon, Nicholas K.; Biegelsen, David K.; and Berkovitz, Michael A., to Xerox Corporation. Electrographic printing system. 4,419,680., Cl. 346-163.000.
Sherman, Philip B., to Texaco Inc. Recovery of solvent from a hydrocarbon extract. 4,419,227., Cl. 208-326.000.
Sherstobitov, Igor V.: *See—*
Bodrov, Igor S.; Gudz, Anatoly G.; Lukianova, Tatyana M.; Nitskevich, Vladimir P.; Ogurtsov, Anatoly P.; Salnikov, Andrei F.; Fomichev, Mikhail M.; Sherstobitov, Igor V.; and Schepakin, Mikhail B., 4,418,530., Cl. 60-39.181.
Sherwood Medical Company: *See—*
Satchell, Fred E.; Cornell, William D.; Uitz, Mark O.; and Walker, Clarence L., 4,418,580., Cl. 73-864.130.
Shibukawa, Nobuyuki: *See—*
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Sano, Yoshimoto; Shibukawa, Nobuyuki; and Hashimoto, Takashi, 4,419,349., Cl. 424-195.000.
Shida, Mitsuzo: *See—*
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, 4,419,408., Cl. 428-424.400.
Shiga, Tsutomu; and Nimura, Takayasu, to Nippondenso Co., Ltd. Alternator assembly having a rectifier device in thermal contact with case and cover. 4,419,597., Cl. 310-68.00D.
Shikano, Hiroshi; and Harada, Tsutomu. Packing materials. 4,419,455., Cl. 501-95.000.
Shiley, Inc.: *See—*
Nebergall, Perry A.; and French, Robert C., 4,419,095., Cl. 604-96.000.
Shim, Joosup; and Law, Derek A., to Mobil Oil Corporation. Aqueous lubricant. 4,419,251., Cl. 252-32.70E.
Shim, Joosup, to Mobil Oil Corporation. Aqueous lubricant. 4,419,252., Cl. 252-32.70E.
Shimano Industrial Company Limited: *See—*
Nakajima, Hideki, 4,418,877., Cl. 242-84.21R.
Shimano, Keizo, 4,418,584., Cl. 74-594.200.
Shimano, Keizo, to Shimano Industrial Company Limited. Gear crank for a bicycle. 4,418,584., Cl. 74-594.200.
Shimizu, Hideo: *See—*
Murakami, Ryoichi; Shimizu, Hideo; Yoshii, Takashi; Ishida, Minoru; and Yonekura, Hiroto, 4,419,147., Cl. 148-31.500.
Shimizu, Kazuyuki: *See—*
Yoshimi, Kazuhiko; Shimizu, Kazuyuki; Watari, Takashi; and Kusumoto, Katsunori, 4,418,632., Cl. 114-102.000.
Shimizu, Keiichi; and Mochida, Haruo, to Nissan Motor Company, Limited; and Kokusan Kinzoku Kogyo Co., Ltd. Electronic door locking system for an automotive vehicle. 4,419,712., Cl. 361-172.000.
Shimomoto, Yasuharu: *See—*
Ishioka, Sachio; Imamura, Yoshinori; Shimomoto, Yasuharu; Ataka, Saburo; Tanaka, Yasuo; and Maruyama, Eiichi, 4,419,604., Cl. 313-385.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Tanaka, Masaki; and Yamaguchi, Koichi, 4,419,391., Cl. 427-387.000.
Shinbori, Takeyoshi, to NHK Spring Co., Ltd. Apparatus for controlling the friction between the leaf springs of a laminated leaf spring assembly. 4,418,896., Cl. 267-36.00R.
Shinko Machinery Works Inc.: *See—*
Shirai, Shigeji, 4,418,499., Cl. 51-3.000.
Shinoda, Nobuhiko: *See—*
Kawabata, Takashi; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,419,574., Cl. 250-204.000.
Shinoura, Osamu: *See—*
Isobe, Yukihiro; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, 4,419,406., Cl. 428-422.000.
Shioyama, Tod K.; and Straw, Jim J., to Phillips Petroleum Company. Recovery and rejuvenation of Wacker-type catalysts. 4,419,525., Cl. 568-401.000.
Shipley Company Inc.: *See—*
Gulla, Michael; and Connelly, Marc, 4,419,183., Cl. 156-666.000.
Shirai, Shigeji, to Shinko Machinery Works Inc. Cutter grinding machine. 4,418,499., Cl. 51-3.000.
Shiraishi, Yuma; and Oota, Yoshihiko, to Victor Company of Japan, Ltd. Color video signal recording and/or reproducing system. 4,419,698., Cl. 358-330.000.
Shriver, Clem B.: *See—*
Perkins, William G.; and Shriver, Clem B., 4,419,320., Cl. 264-296.000.
Shubow, Calvin; and Skinner, Robert V., to Quadco Component Systems, Inc. Bonded aggregate structures and production thereof. 4,419,133., Cl. 106-85.000.
Shultz, Richard E.; and Voecks, William E., Jr., to Burroughs Corporation. Automatic reloader-elevator for cut sheet printing apparatus. 4,418,907., Cl. 271-157.000.
Sidebottom, Donald L., to General Electric Company. Air conditioning control system with user power up mode selection. 4,418,744., Cl. 165-25.000.
Sidorenko, Igor G.: *See—*
Bondarenko, Oleg P.; Genis, Igor A.; Baglai, Vitaly M.; Fedorovsky, Boris B.; Medovar, Boris I.; Timashov, Grigory A.; Us, Vasily I.; Pavlichenko, Georgy S.; and Sidorenko, Igor G., 4,418,741., Cl. 164-454.000.
Siegfried, Robert W., II, to Atlantic Richfield Company. Continuous wave sonic logging. 4,419,748., Cl. 367-31.000.
Siemens Aktiengesellschaft: *See—*
Becker, Michael; Feudt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,419,621., Cl. 324-51.000.
Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, 4,419,204., Cl. 204-206.000.
Branston, David, 4,419,605., Cl. 313-485.000.
Druegh, Paul; and von Winnicki, Kalixt, 4,419,634., Cl. 331-117.00R.
Herberg, Helmut, 4,419,683., Cl. 357-38.000.
Hundt, Eckart; and Trautenberg, Elmar, 4,418,575., Cl. 73-607.000.
Keil, Rudolf; Auracher, Franz; and Stockmann, Michael, 4,418,980., Cl. 350-96.130.
Lang, Josef; Hollaus, Reinhard; Reeh, Ulrike; Denk, Hans; and Habrich, Reiner, 4,419,531., Cl. 136-251.000.
Meyer, Franz J., 4,419,609., Cl. 318-7.000.
Siemens Gammasonics, Inc.: *See—*
Guth, William R., 4,419,577., Cl. 250-252.100.
Hawman, Eric G., 4,419,763., Cl. 378-149.000.
Sifferman, Thomas R., to Conoco Inc. Methods of inhibiting the flow of water in subterranean formations. 4,418,755., Cl. 166-281.000.
Sigety, Stephen, Jr., to General Motors Corporation. Windshield wiper apparatus. 4,418,440., Cl. 15-250.210.
Silverman, Harold: *See—*
Foster, Dean H.; Mersereau, Robert E.; and Silverman, Harold, 4,418,515., Cl. 53-457.000.
Simmons, Robert A., to Bantam Systems, Inc. Method of manufacture of ventilated sheet metal floor members. 4,418,558., Cl. 72-177.000.
Simon-Hartley Limited: *See—*
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., 4,419,243., Cl. 210-618.000.
Simon, Robert H. M., to Monsanto Company. Process for preparing ABS polymeric polyblends. 4,419,492., Cl. 525-71.000.
Sin, Yoon K.; and Kim, Daiuk, to Pohang Iron & Steel Co., Ltd. Nonmetallic catalyst compositions for oxidation of ammonia and process for making the catalyst. 4,419,274., Cl. 502-304.000.
Sing, Gerhard; and Wellendorf, Klaus, to Dr. -Ing. Rudolf Hell GmbH. Method for the improved reproduction of image in reproduction technology. 4,419,691., Cl. 358-75.000.
Singer Company, The: *See—*
Graham, Richard P., 4,418,630., Cl. 112-261.000.
Kornatowski, Boleslaw, 4,418,809., Cl. 192-67.00R.
Singh, Rajendra: *See—*
Czubatyj, Wolodymyr; Singh, Rajendra; Doehler, Joachim; Allred, David D.; and Reyes, Jaime M., 4,419,533., Cl. 136-259.000.
Sinha, Bikash K., to Schlumberger Technology Corporation. Stress-compensated quartz resonators. 4,419,600., Cl. 310-361.000.
Sisson, Albert E., to Bendix Corporation, The. Electrically controlled unit injector. 4,418,867., Cl. 239-88.000.
Sitek, George J; and Bredeweg, Roger L., to Leco Corporation. Furnace electrode. 4,419,754., Cl. 373-118.000.
Sizelove, Cary L.: *See—*
Dietrich, William J., Sr.; and Sizelove, Cary L., 4,418,761., Cl. 172-271.000.
Skerlos, Peter C.: *See—*
Puskas, Jeffery A.; Skerlos, Peter C.; and Zato, Thomas J., 4,419,662., Cl. 340-750.000.
Skinner, Robert V.: *See—*
Shubow, Calvin; and Skinner, Robert V., 4,419,133., Cl. 106-85.000.
Skinnger, Robert T. J.: *See—*
Sosnowski, Stanislaw J. A.; and Skinnger, Robert T. J., 4,419,054., Cl. 417-294.000.
Skotchinsky Institut Gornogo Dela: *See—*
Balazs, Karoly; Firstov, Vladislav D.; Frcska, Miklos; Gal, Laszlo; Hlavay, Sandor; Huber, Lajos; Korbuly, Jozsef; Mahig, Laszlo; and Ponomarenko, Juri F., 4,418,715., Cl. 137-508.000.
Skrabut, Eugene M.: *See—*
Yannas, Ioannis V.; Burke, John F.; Orgill, Dennis P.; and Skrabut, Eugene M., 4,418,691., Cl. 128-156.000.
Slager, Donald M.; and Barker, William C., to TRW Inc. Controlled scintillation rate decoy. 4,419,669., Cl. 343-18.00D.
Slaughter, Edward R., to United Technologies Corporation. Titanium-diboride dispersion strengthened iron materials. 4,419,130., Cl. 75-244.000.
Slavin, Michael; and Miller, Ellsworth S., to Lectron Products, Inc. Solenoid. 4,419,641., Cl. 335-219.000.
Slee, Andrew M.: *See—*
Stroz, John J.; and Slee, Andrew M., 4,419,346., Cl. 424-151.000.
Sliemers, Francis A.; and McGinniss, Vincent D., to Battelle Development Corporation. Plasma polymerized color coatings. 4,419,382., Cl. 427-40.000.
Sloane, Edwin A., to Fairchild Camera & Instrument Corp. Method and apparatus for digital converter testing. 4,419,656., Cl. 340-347.0CC.
Smetana, Andrew; and Hanson, James M., to General Electric Company. Wedge base lamp socket assembly. 4,418,973., Cl. 339-31.00L.
Smith, Leslie H., to Imperial Chemical Industries PLC. Alkanolamine derivatives. 4,419,363., Cl. 424-285.000.
Smith, Richard H., to General Motors Corporation. Diesel exhaust particulate trap with axially stacked filters. 4,419,113., Cl. 55-484.000.
Smith, Roger M.; and Smith, Steven J. Adapter frame for roto-tillers. 4,418,731., Cl. 144-194.000.

Smith, Steven J.: *See*—
Smith, Roger M.; and Smith, Steven J., 4,418,731., Cl. 144-194.000.
Smith, Thomas W. Centrifugal pump. 4,419,043., Cl. 415-7.000.
Smolanoff, Joel R., to Rohm and Haas Company. Arthropod repellants. 4,419,360., Cl. 424-258.000.
Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Turco, Vincenzo; and Pompili, Antonio, 4,419,318., Cl. 264-274.000.
Snow, Nicholas J., Jr.: *See*—
May, Ronald L.; and Snow, Nicholas J., Jr., 4,419,114., Cl. 62-17.000.
Snyder, Marvin K.: *See*—
Sanders, William J.; Snyder, Marvin K.; and Harter, James W., 4,418,684., Cl. 126-419.000.
SOCAPEX: *See*—
Lamarche, Dominique; and Soster, Marie C., 4,418,855., Cl. 225-96.000.
Societa Italiana Vetro - SIV - S.p.A.: *See*—
Kalbskopf, Reinhard; and Baumberger, Otto, 4,419,570., Cl. 219-522.000.
Societe Anonyme Diamant Boart: *See*—
Lambot, Honore J., 4,418,770., Cl. 175-58.000.
Societe Anonyme Rubson S.A.F.: *See*—
Dumas, Jean A.; and Naudin, Hildebert, 4,419,111., Cl. 55-388.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Hersom, Albert C.; Wright, Kenneth W.; and Brittain, John E., 4,419,376., Cl. 426-402.000.
Maillard, Francois; and Shepherd, David, 4,419,449., Cl. 435-170.000.
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Andre, Pierre A.; Thevenin, Jean-Claude P. H. P.; Girault, Jean-Pierre Y. B.; and Richter, Gerhard, 4,419,045., Cl. 415-119.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See*—
Menioux, Claude C. F., 4,419,057., Cl. 418-36.000.
Societe Nationale Industrielle Aerospatiale: *See*—
Coffy, Rene L.; and Azeau, Jean J. E., 4,419,398., Cl. 428-174.000.
Societe pour l'Etude et la Fabrication des Circuits Integres Speciaux (EFCIS): *See*—
Bertails, Jean P.; Perrin, Cristian; and Tallaron, Louis, 4,419,631., Cl. 330-255.000.
Soclof, Sidney I., to Rockwell International Corporation. Method of forming lateral bipolar transistors. 4,419,150., Cl. 148-187.000.
Soderquist, Cynthia A.: *See*—
Kelly, John A.; and Soderquist, Cynthia A., 4,419,327., Cl. 422-17.000.
Solitec, Inc.: *See*—
Wills, James C.; and Spenser, Douglas S., 4,418,639., Cl. 118-50.000.
Somfai, Eva: *See*—
Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezso; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, 4,419,524., Cl. 562-506.000.
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Coughlin, James E.; Sommerfeld, Eugene G.; and Strolle, Clifford H., 4,419,476., Cl. 524-284.000.
Sone, Masazumi: *See*—
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,418,660., Cl. 123-143.00B.
Imai, Iwao; and Sone, Masazumi, 4,419,547., Cl. 200-19.00R.
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Nishino, Atsushi; Suzuki, Tadashi; and Sonetaka, Kazunori, 4,419,302., Cl. 261-142.000.
Sonnenberger, Paul; Graffenberger, Wilhelm; Cense, Adriaan; and Van Westen, Petrus A. M., to U.S. Philips Corporation. Circuit arrangement for transmitting two signals over one line in opposite directions. 4,419,752., Cl. 370-29.000.
Sony Corporation: *See*—
Wilkinson, James H., 4,419,693., Cl. 358-167.000.
Yagi, Hiroyuki; and Baba, Takashi, 4,419,770., Cl. 455-301.000.
Yamamoto, Yoshihiro; Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, 4,419,695., Cl. 358-198.000.
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Whitney, John A.; Dwyer, Daniel T.; and Sorenson, Peter F., 4,418,774., Cl. 177-210.0FP.
Sosnowski, Stanislaw J. A.; and Skinnger, Robert T. J., to Lucas Industries Limited. Liquid fuel injection pumping apparatus. 4,419,054., Cl. 417-294.000.
Soster, Marie C.: *See*—
Lamarche, Dominique; and Soster, Marie C., 4,418,855., Cl. 225-96.000.
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Galle, Serge; Hautdidier, Jerome; and Soulet, Christian, 4,418,556., Cl. 72-62.000.
Southern Gas Association: *See*—
Brown, Morton E., 4,419,624., Cl. 324-83.00D.
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Hart, James E.; Spalding, Willard P.; and Kyllonen, Allen W., 4,418,799., Cl. 188-153.00R.
Spann, Donald C. Orthopedic support package and method. 4,418,514., Cl. 53-436.000.
Sparks, Gregory E.: *See*—
Kramer, Kenneth D.; Stoss, Kenneth J.; and Sparks, Gregory E., 4,419,642., Cl. 335-227.000.
Spector, George: *See*—
Lesly, Michel; and Spector, George, 4,418,638., Cl. 116-87.000.
Speier, John L.; and Liles, Donald T., to Dow Corning Corporation. Apparatus for rapidly freezing molten metals and metalloids in particulate form. 4,419,060., Cl. 425-8.000.
Spenser, Douglas S.: *See*—
Wills, James C.; and Spenser, Douglas S., 4,418,639., Cl. 118-50.000.
Sperry Corporation: *See*—
Branigin, Michael H.; Sherbert, Edward G.; and Krasucki, Joseph F., Jr., 4,419,724., Cl. 364-200.000.
Donovan, James T.; and Webster, E. Graham, 4,418,516., Cl. 56-228.000.
Ehrhart, Philip J.; Donovan, James T.; and Webster, E. Graham, 4,418,517., Cl. 56-228.000.
George, Benjamin T.; and Chen, Patricia C., 4,419,725., Cl. 364-200.000.
Koch, Earl E.; Gamber, A. Dale; and Ehrhart, Philip J., 4,418,518., Cl. 56-228.000.
O'Brien, Steven M., 4,419,629., Cl. 328-72.000.
Paul, Dieter G., 4,419,762., Cl. 377-66.000.
Weidner, Albert J., 4,419,726., Cl. 364-200.000.
Spitz, Erich; and Micheron, Francois, to Thomson-CSF. Piezoelectrically controlled piezoresistor. 4,419,598., Cl. 310-311.000.
Spohr, Horst, to Bautex Adolf Stover KG. Process for producing slats for a vertical slatted venetian blind. 4,418,461., Cl. 29-407.000.
Sprague Electric Company: *See*—
Burn, Ian; and Neirman, Stephen M., 4,419,310., Cl. 264-59.000.
Riley, Donald J.; and Scott, John W., 4,419,259., Cl. 252-142.000.
Springer, Virgil E., to Regal International, Inc. Reinforced carboxy nitrile polymer compositions containing particulate nickel. 4,419,479., Cl. 524-413.000.
Sprockhoff, Volker, to ITT Industries, Inc. Control system for a vehicular braking system incorporating a hydrodynamic brake and a friction brake. 4,418,963., Cl. 303-3.000.
Square D Company: *See*—
Pear, Daniel G., 4,419,715., Cl. 361-335.000.
Stachnik, John. Variable range sighting mechanism for use with archery bow. 4,418,479., Cl. 33-265.000.
Stackhouse, James L., Jr.: *See*—
Krusemark, Kenneth J.; and Stackhouse, James L., Jr., 4,418,597., Cl. 83-478.000.
Stafford, Donald W.: *See*—
Bowlds, Patsy A.; Cassidy, Bruce M.; Graham, Arthur E.; Huljak, Robert J.; Stafford, Donald W.; and Tao, Deh C., 4,419,024., Cl. 400-120.000.
Stake, Dennis G.: *See*—
Anderson, Gary W.; and Stake, Dennis G., 4,418,815., Cl. 198-476.000.
Stamm, Johann A., to Rockwell International Corporation. Turbine meter rotor. 4,419,052., Cl. 416-214.00A.
Standard Oil Company (Indiana): *See*—
Burns, Charles W., Jr., 4,418,594., Cl. 83-19.000.
Paschke, Edward E.; and Throne, James L., 4,419,462., Cl. 521-134.000.
Standex International Corporation: *See*—
Lennon, Robert D., 4,419,645., Cl. 336-65.000.
Stanton, Austin N. Rotary motion transformer. 4,418,656., Cl. 123-58.0AM.
Starell, Karl-Erik: *See*—
Kallaes, Elis; and Starell, Karl-Erik, 4,418,891., Cl. 254-260.000.
Starke, Roy R., to United States of America, Air Force. Two-way flow valve. 4,418,716., Cl. 137-605.000.
Stauffer Chemical Company: *See*—
Letchworth, Peter E.; and Williamson, Thomas B., 4,419,350., Cl. 424-225.000.
Pallos, Ferenc M.; and Gaughan, Edmund J., 4,419,523., Cl. 560-12.000.
Steeb, Jorg: *See*—
Clausen, Nils; and Steeb, Jorg, 4,419,311., Cl. 264-60.000.
Steen, Mark E.: *See*—
Haines, Stephen W.; Marshall, Stephen R.; Steen, Mark E.; and Swanland, Robert C., 4,418,944., Cl. 285-24.000.
Stefanini, Zorro: *See*—
Frew, Duncan W.; Stefanini, Zorro; Schnee, Edward A.; and di Ricco, Leo, 4,419,257., Cl. 252-62.540.
Stein Industri: *See*—
Pouderoux, Pierre; Salon, Guy; and Nguyen-Thanh, Thong, 4,418,748., Cl. 165-134.00R.
Steinmann, Phyllis R. Mathematical teaching/learning aid and method of use. 4,419,081., Cl. 434-188.000.
Steinmetz, Arthur, to Riedel-de Haen Aktiengesellschaft. Process for the preparation of a 2-alkylphenol. 4,419,529., Cl. 568-772.000.
Stenerud, Jan, to Jan Stenerud and Company, Inc. Football kicking tee. 4,418,910., Cl. 273-55.00B.
Stephan, Willi: *See*—
Mall, Gunther; and Stephan, Willi, 4,418,629., Cl. 112-146.000.
Stephenson, Michael D.; and Waller, Winston A., to Elliott Brothers (London) Limited. Position measuring system. 4,419,012., Cl. 356-141.000.

Stepp, Lee W., to Halliburton Company. Method and apparatus for gravel packing a zone in a well. 4,418,754., Cl. 166-278.000.

Stereographics Corp.: *See*—
Lipton, Lenny, 4,418,993., Cl. 352-57.000.

Stetter, Jorg: *See*—
Kramer, Wolfgang; Buchel, Karl H.; Stetter, Jorg; Frohberger, Paul-Ernst; Brandes, Wilhelm; and Scheinpflug, ans, 4,419,361., Cl. 424-273.00R.

Stevens, Randy R.: *See*—
Jarosz, Anthony M.; and Stevens, Randy R., 4,419,658., Cl. 340-521.000.

Stewart, Roger G.; and Mazin, Moshe, to RCA Corporation. Read only memory (ROM) having high density memory array with on pitch decoder circuitry. 4,419,741., Cl. 365-72.000.

Stiebel, Ariel, to Wagen of America, Inc. Apparatus and method for monitoring and controlling resistance spot welding. 4,419,558., Cl. 219-109.000.

Stobb, Inc.: *See*—
Stobb, Walter J., 4,419,035., Cl. 414-71.000.

Stobb, Walter J., to Stobb, Inc. Method and apparatus for moving bundles of sheets. 4,419,035., Cl. 414-71.000.

Stock Equipment Company: *See*—
Finet, Alain; Nerone, Louis R.; and Zenisek, Michael J., 4,418,773., Cl. 177-16.000.

Stockmann, Michael: *See*—
Keil, Rudolf; Auracher, Franz; and Stockmann, Michael, 4,418,980., Cl. 350-96.130.

Stockton, Thomas R., to Ford Motor Company. Transmission lubrication and motor cooling system. 4,418,777., Cl. 180-65.00E.

Stoeger, Klaus: *See*—
Birkle, Siegfried; Gehring, Johann; and Stoeger, Klaus, 4,419,204., Cl. 204-206.000.

Stoll, Kurt; and Rudle, Manfred. Valve insert and valves designed therewith. 4,418,711., Cl. 137-269.000.

Stoll, Milton. Methods and apparatus for producing coherent of monolithic elements. 4,419,180., Cl. 156-617.0SP.

Stone, Orison W., to Pack Image, Inc. Basket carrier for bottles having transverse dividers inserted through the bottom wall. 4,418,818., Cl. 206-196.000.

Stoss, Kenneth J.: *See*—
Kramer, Kenneth D.; Stoss, Kenneth J.; and Sparks, Gregory E., 4,419,642., Cl. 335-227.000.

Stoub, James: *See*—
Sandberg, Kenneth; and Stoub, James, 4,418,446., Cl. 17-32.000.

Stowe, David W., to Gould Inc. Quadrature fiber-optic interferometer matrix. 4,418,981., Cl. 350-96.150.

Strahan, Travis R. Mounting bracket for gunsight. 4,418,487., Cl. 42-1.0ST.

Straailla, Dieter; Meindl, Hubert; Moldovanyi, Laszlo; and Fearnley, Charles, to Ciba-Geigy Corporation. Quaternary, copolymeric, high molecular weight ammonium salts based on acrylic compounds, their preparation, and their use in cosmetics. 4,419,344., Cl. 424-70.000.

Strauss, H. William; Moore, Richard H.; and Alpert, Nathaniel M., to Massachusetts General Hospital. Variable angle slant hole collimator. 4,419,585., Cl. 250-505.100.

Straw, Jim J.: *See*—
Shioyama, Tod K.; and Straw, Jim J., 4,419,525., Cl. 568-401.000.

Streeter, Robert R.; Whitehorn, Vincent J.; and Nicholas, Earl C., to L. D. Schreiber Cheese Co., Inc. Method and apparatus for draining whey for making large sized blocks of cheese. 4,418,616., Cl. 99-458.000.

Striebel, Edmund E.: *See*—
Faucher, Joseph E.; Wright, Richard R.; Pane, Francis C., Jr.; Kwoka, David; and Striebel, Edmund E., 4,418,543., Cl. 60-742.000.

Stringer, Carl: *See*—
LaForce, Jean, 4,418,860., Cl. 228-196.000.

Stringer, Carl T.: *See*—
LaForce, Jean, 4,418,860., Cl. 228-196.000.

Stringer Oil and Gas Company, Inc.: *See*—
LaForce, Jean, 4,418,860., Cl. 228-196.000.

Strolle, Clifford H.: *See*—
Coughlin, James E.; Sommerfeld, Eugene G.; and Strolle, Clifford H., 4,419,476., Cl. 524-284.000.

Strom, E. Thomas; and Espenscheid, Wilton F., to Mobil Oil Corporation. Method for restoring contaminants to base levels in previously leached formations. 4,418,961., Cl. 299-5.000.

Stroz, John J.; and Slee, Andrew M., to Nabisco Brands, Inc. Method and composition to inhibit the growth of *Streptococcus mutans* by the use of saccharin/fluoride combination. 4,419,346., Cl. 424-151.000.

Stubler, Catherine E.: *See*—
Puletti, Paul P.; and Stubler, Catherine E., 4,419,494., Cl. 525-95.000.

Stucka, Stephen E.: *See*—
Norgren, Kent S.; and Stucka, Stephen E., 4,419,592., Cl. 307-241.000.

Sublett, Bobby J., to Eastman Kodak Company. Copolyester adhesives. 4,419,507., Cl. 528-302.000.

Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. K.G.: *See*—
Dietzsch, Kurt; and Knoblauch, Rainer, 4,418,743., Cl. 165-12.000.

Suderman, Darrel R., to SCM Corporation. Packaged topping for salads and the like. 4,419,371., Cl. 426-94.000.

Sugar, Janos: *See*—
Elekes, Ilona; Institoris, Laszlo; Medzihradsz, Kalman; Otvos, Laszlo; Medzihradszky-Schweiger, Hedvig; De Gleria, Katalin; Sugar, Janos; Relle, Somfai; Eckhardt, Sandor; Hidy, Ivan; and Kerpel-Fronius, Sandor, 4,419,522., Cl. 549-557.000.

Sugawara, Yoshitaka; Kamei, Tatsuya; and Sakurai, Tetsuma, to Hitachi, Ltd.; and Nippon Telegraph & Telephone Public Corporation. Semiconductor device. 4,419,685., Cl. 357-53.000.

Sugihara, Yasuhiko: *See*—
Matsumoto, Junji; Kamiya, Shohei; and Sugihara, Yasuhiko, 4,418,687., Cl. 128-1.00C.

Sugimoto, Terutaka. Perfumed pendant. 4,419,395., Cl. 428-28.000.

Sugimoto, Terutaka. Three-dimensional perfumed seal. 4,419,396., Cl. 428-40.000.

Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, to Kubota Ltd. Heat resistant cast iron-nickel-chromium alloy. 4,419,129., Cl. 420-584.000.

Sugitani, Yuji: *See*—
Nomura, Hirokazu; and Sugitani, Yuji, 4,419,563., Cl. 219-137.00R.

Sugiura, Takeo: *See*—
Etoh, Kuniomi; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, 4,419,438., Cl. 430-275.000.

Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Case for a disc-shaped recording medium. 4,419,710., Cl. 360-133.000.

Sugiyama, Masami: *See*—
Kasahara, Yasushi; Ashihara, Yoshihiro; Sugiyama, Masami; and Harada, Takahiro, 4,419,445., Cl. 435-20.000.

Sugiyama, Masatoshi; Nakanishi, Ichiro; and Suzuki, Yoshiaki, to Fuji Photo Film Co., Ltd. Waterproofing method for ink jet records. 4,419,388., Cl. 427-288.000.

Sullivan, Floyd A.; Elbers, Arthur H.; and Trierweiler, Charles M., to General Motors Corporation. Vehicle strut suspension with camber adjustment. 4,418,938., Cl. 280-661.000.

Sulzer Brothers Limited: *See*—
Rees, Karl, 4,418,652., Cl. 122-468.000.

Sumitomo Durez Company, Ltd.: *See*—
Saeki, Yukio; and Inoue, Naomitsu, 4,419,477., Cl. 524-290.000.

Sumitomo Electric Industries Limited: *See*—
Nakahara, Motohiro; Yoshioka, Naoki; Yokota, Hiroshi; Miyajiri, Tetsuo; and Watanabe, Minoru, 4,419,116., Cl. 65-3.120.

Sumitomo Naugatuck Co., Ltd.: *See*—
Sakano, Hajime; Nakai, Fumio; and Tomari, Yukio, 4,419,491., Cl. 525-67.000.

Sun Chemical Corporation: *See*—
Yanutola, Michael J., 4,419,483., Cl. 524-701.000.

Sun Electric Corporation: *See*—
Beck, James E.; and Patel, Arvind M., 4,418,566., Cl. 73-23.000.

Sunder, Shyam: *See*—
Peet, Norton P.; and Sunder, Shyam, 4,419,357., Cl. 424-251.000.

Sundstrand Corporation: *See*—
Pollman, Frederic W., 4,419,610., Cl. 318-12.000.

Sung, Rodney L., to Texaco Inc. Maleic anhydride-amine reaction product corrosion inhibitor for alcohols. 4,419,105., Cl. 44-53.000.

Surman, James J., to Eaton Corporation. Hot film fluid flowmeter with auxiliary flow sensing. 4,418,568., Cl. 73-202.000.

Suschitzky, John L.: *See*—
Cox, David; Cairns, Hugh; Chadwick, Nigel; and Suschitzky, John L., 4,419,352., Cl. 424-248.400.

Sussman, Milton H., to Warner Lambert Technologies, Inc. Microscope objective. 4,418,988., Cl. 350-414.000.

Suzuki, Tadashi: *See*—
Nishino, Atsushi; Suzuki, Tadashi; and Sonetaka, Kazunori, 4,419,302., Cl. 261-142.000.

Suzuki, Yoshiaki: *See*—
Sugiyama, Masatoshi; Nakanishi, Ichiro; and Suzuki, Yoshiaki, 4,419,388., Cl. 427-288.000.

Svensson, Leif A.: *See*—
Olsson, O. A. Torsten; Svensson, Leif A.; and Wetterlin, Kjell I. L., 4,419,364., Cl. 424-300.000.

Swanland, Robert C.: *See*—
Haines, Stzphen W.; Marshall, Stephen R.; Steen, Mark E.; and Swanland, Robert C., 4,418,944., Cl. 285-24.000.

Swanson, Robert C.: *See*—
Lenzini, Albert A.; Swanson, Robert C.; Roberts, James T.; and Pruski, John A., 4,418,976., Cl. 339-91.00R.

Sway, Boris. Gravity fed water treatment apparatus. 4,419,235., Cl. 210-282.000.

Swearingen, Edward J., Jr., to Fairchild Swearingen Corporation. Propeller spinner. 4,419,053., Cl. 416-234.000.

Swenson, Oscar J. Manual torque magnifying impact tool. 4,418,768., Cl. 173-93.500.

Swithenbank, Colin, to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-3'-oxygen-substituted-4'-substituted diphenyl ethers. 4,419,122., Cl. 71-98.000.

Swithenbank, Colin, to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-3'-carbon-substituted-4'-substituted diphenyl ethers. 4,419,123., Cl. 71-98.000.

Swithenbank, Colin, to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-3'-nitrogen-substituted-4'-substituted diphenyl ethers. 4,419,124., Cl. 71-98.000.

Sybron Corporation: *See*—
Behl, Robert S.; and Ellis, Franklin H., 4,419,091., Cl. 604-20.000.

Symons Corporation: *See*—
Schimmel, Vernon R., 4,418,884., Cl. 249-11.000.

Syntex (U.S.A.) Inc.: *See*—
Jones, Gordon H.; and Young, John, 4,419,368., Cl. 424-331.000.

Nestor, John J.; Jones, Gordon H.; and Vickery, Brian H., 4,419,347., Cl. 424-177.000.
Szporny, Laszlo: *See*—
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.
T. J. Company: *See*—
Jarosz, Anthony M.; and Stevens, Randy R., 4,419,658., Cl. 340-521.000.
Tabar, Ronald J.; and Killgoar, Paul C., Jr., to Ford Motor Company. Soft, fatigue resistant elastomer articles. 4,419,480., Cl. 524-525.000.
Tachikawa, Kyoji; Sekine, Hisashi; Itoh, Kikuo; and Iijima, Yasuo, to National Research Institute for Metals. Process for producing Nb_3Sn superconductor. 4,419,145., Cl. 148-11.50F.
Tada, Kiichiro: *See*—
Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, 4,419,643., Cl. 335-234.000.
Tafco Equipment Company: *See*—
Ankeny, V. Scott, 4,418,851., Cl. 224-42.060.
Taguchi, Masao; and Ito, Takashi, to Fujitsu Limited. Semiconductor memory device. 4,419,743., Cl. 365-149.000.
Taguchi, Michihiro, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Tilt lever returning mechanism for outboard engine. 4,419,083., Cl. 440-56.000.
Taig, Alistair G., to Bendix Corporation, The. Locking device. 4,418,583., Cl. 74-501.50R.
Tajima, Osamu: *See*—
Saito, Takashi; Tajima, Osamu; and Mochizuki, Masafumi, 4,419,709., Cl. 360-133.000.
Takada, Juichiro. Coupling assembly for the drive device of a passive vehicle occupant restraint belt system. 4,418,940., Cl. 280-804.000.
Takahara, Shoichiro: *See*—
Takanashi, Hiroshi; and Takahara, Shoichiro, 4,418,987., Cl. 350-337.000.
Takahashi, Makoto: *See*—
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,419,129., Cl. 420-584.000.
Takahashi, Mutsumi; Uwabe, Toshio; Nagase, Toshio; Sato, Shosuke; and Matsuzawa, Hideshi, to Tokyo Keiki Company Ltd.; and Totec Co. Ltd. Check digit calculator. 4,419,572., Cl. 235-69.000.
Takahashi, Nobuhiro, to Wako Kemikaru Kabushiki Kaisha. Impregnant for making semi-rigid or rigid resin foams. 4,419,261., Cl. 252-182.000.
Takahashi, Shoichiro, to Kenlock Corporation. Locking device in a telescopic tubular tripod leg element assembly. 4,419,025., Cl. 403-14.000.
Takahashi, Yasuyoshi; Sakiguchi, Shigeo; and Sato, Teruyoshi, to Tokyo Electric Co., Ltd. Unit-price presetting method for electronic cash registers. 4,419,738., Cl. 364-900.000.
Takahashi, Yoshiyuki: *See*—
Ueshima, Michio; Takahashi, Yoshiyuki; Kitada, Ritsuo; and Nagai, Isao, 4,419,270., Cl. 502-209.000.
Takanashi, Hiroshi; and Takahara, Shoichiro, to Sharp Kabushiki Kaisha. Polarizer arrangement for a significant improvement in viewing angle characteristic in a liquid crystal display. 4,418,987., Cl. 350-337.000.
Takano, Takeshi: *See*—
Kasori, Mituo; Takano, Takeshi; Maki, Hironori; and Ogino, Naohiko, 4,418,985., Cl. 350-96.340.
Takasago Perfumery Co., Ltd.: *See*—
Yamanaka, Tohr; and Imai, Takashi, 4,419,292., Cl. 260-410.90R.
Takashima, Kiyoshi, to Matsushita Electric Works, Ltd. Plug socket with working condition display. 4,418,979., Cl. 339-113.00L.
Takasugi, Tsuneji: *See*—
Kushida, Machiro; Takasugi, Tsuneji; and Irie, Kenji, 4,419,409., Cl. 428-469.000.
Takenouchi, Mutsuo: *See*—
Hamano, Toshihisa; Ito, Hisao; Takenouchi, Mutsuo; Ozawa, Takashi; Fuse, Mario; and Nakamura, Takeshi, 4,419,696., Cl. 358-294.000.
Takezono, Takashi: *See*—
Okuyama, Yasuhiko; and Takezono, Takashi, 4,419,017., Cl. 368-64.000.
Talafuse, Larry J., to FMC Corporation. Swivel joint for improved bearing and seal life. 4,418,947., Cl. 285-168.000.
Tallaron, Louis: *See*—
Bertails, Jean P.; Perrin. Cristian; and Tallaron, Louis, 4,419,631., Cl. 330-255.000.
Talmadge, Paul C.: *See*—
Lakatos, Edward J.; and Talmadge, Paul C., 4,419,575., Cl. 250-226.000.
Tama, Francine. Electrode attachment method. 4,418,697., Cl. 128-640.000.
Tamamura, Sadao: *See*—
Kojima, Yasuhiko; Konno, Seishi; Tamamura, Sadao; Sano, Yoshimoto; Shibukawa, Nobuyuki; and Hashimoto, Takashi, 4,419,349., Cl. 424-195.000.
Tamura, Zenzo: *See*—
Imai, Kazuhiro; Tamura, Zenzo; and Kobayashi, Shin-ichiro, 4,419,452., Cl. 436-89.000.
Tanaka, Atsuo: *See*—
Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, 4,419,389., Cl. 427-294.000.
Tanaka, Hiroshi; and Sakata, Fusao, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for etching metallic sheet. 4,419,181., Cl. 156-640.000.
Tanaka, Kazushi: *See*—
Isobe, Yukihiro; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, 4,419,406., Cl. 428-422.000.
Tanaka, Masaki; and Yamaguchi, Koichi, to Shin-Etsu Chemical Co., Ltd. Method of imparting improved touch to a fabric. 4,419,391., Cl. 427-387.000.
Tanaka, Shinsaku, to Tanashin Denki Co., Ltd. Auto-reverse device for a two-reel type tape recorder. 4,419,702., Cl. 360-96.400.
Tanaka, Toshikiyo: *See*—
Etoh, Kuniomi; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, 4,419,438., Cl. 430-275.000.
Tanaka, Yasuo: *See*—
Ishioka, Sachio; Imamura, Yoshinori; Shimomoto, Yasuharu; Ataka, Saburo; Tanaka, Yasuo; and Maruyama, Eiichi, 4,419,604., Cl. 313-385.000.
Tanaka, Yoshihiro: *See*—
Matsuda, Motonobu; and Tanaka, Yoshihiro, 4,419,011., Cl. 356-1.000.
Tanashin Denki Co., Ltd.: *See*—
Tanaka, Shinsaku, 4,419,702., Cl. 360-96.400.
Tanson, Aloyse, to Continental Alloys A.A. Metallothermal process for reducing metal oxides. 4,419,127., Cl. 75-10.00R.
Tao, Deh C.: *See*—
Bowlds, Patsy A.; Cassidy, Bruce M.; Graham, Arthur E.; Huljak, Robert J.; Stafford, Donald W.; and Tao, Deh C., 4,419,024., Cl. 400-120.000.
Targowski, Roger W.: *See*—
Hill, Harold I.; and Targowski, Roger W., 4,419,020., Cl. 374-12.000.
Tatecka, Kiyoshi; and Hayashida, Yoshihiro, to Tokico Ltd. Pneumatic servo booster. 4,418,611., Cl. 91-369.00A.
Taylor, James M. Single-fluke anchor. 4,418,635., Cl. 114-304.000.
TDK Electronics Co., Ltd.: *See*—
Isobe, Yukihiro; Tanaka, Kazushi; Nishimatsu, Masaharu; Shinoura, Osamu; and Kubota, Yuichi, 4,419,406., Cl. 428-422.000.
Teijin Limited: *See*—
Matsumura, Shunichi; and Inata, Hiroo, 4,419,308., Cl. 264-49.000.
Teledyne Farris Engineering: *See*—
Cullie, Eugene C., 4,418,714., Cl. 137-478.000.
Teletype Corporation: *See*—
Lenzini, Albert A.; Swanson, Robert C.; Roberts, James T.; and Pruski, John A., 4,418,976., Cl. 339-91.00R.
Woodier, James G., 4,419,707., Cl. 360-106.000.
Temple, Davis L., Jr.: *See*—
Catt, John D.; and Temple, Davis L., Jr., 4,419,358., Cl. 424-253.000.
Tenny, Alfred M. Method of removing soluble sulfide residue from scrubber water waste. 4,419,247., Cl. 210-726.000.
Terada, Jiro; and Nitta, Tsunehara, to Matsushita Electric Industrial Co., Ltd. Multi-functional sensing or measuring system. 4,419,021., Cl. 374-101.000.
Teraoka, Akira; and Nakamura, Tadashi, to Kubota, Ltd. Tractor. 4,418,783., Cl. 180-209.000.
Terasawa, Koji: *See*—
Kasugayama, Yukio; Terasawa, Koji; and Hattori, Yoshihumi, 4,419,677., Cl. 346-140.00R.
Kasugayama, Yukio; Terasawa, Koji; and Hattori, Yoshihumi, 4,419,678., Cl. 346-140.00R.
Texaco Inc.: *See*—
Castagnos, Leonce F., Jr.; and Pratt, Roy E., 4,419,221., Cl. 208-113.000.
Crone, John M., Jr., 4,419,394., Cl. 427-434.500.
Flournoy, Norman E., 4,418,574., Cl. 73-601.000.
Kaufman, Benjamin J.; Sawicki, Robert A.; and Levine, Stephen A., 4,419,255., Cl. 252-51.50A.
Morel, Thomas J.; and Haynes, Stewart, Jr., 4,418,753., Cl. 166-273.000.
Sherman, Philip B., 4,419,227., Cl. 208-326.000.
Sung, Rodney L., 4,419,105., Cl. 44-53.000.
Texas Instruments Incorporated: *See*—
Henderson, Alva E., 4,419,540., Cl. 381-51.000.
Hunter, Arthur C.; and Hamilton, Stephen P., 4,419,746., Cl. 365-189.000.
Marcoux, Leo, 4,419,564., Cl. 219-206.000.
Texas Medical Instruments, Inc.: *See*—
Modisette, James E.; and Johnson, Ralph B., 4,419,692., Cl. 358-113.000.
Texasgulf Inc.: *See*—
Higgins, Rudolph S., 4,418,960., Cl. 299-5.000.
Teyssie, Philippe J.; Jerome, Robert J.; and Broze, Guy J., to Unibra Societe Anonyme. Products containing polymer chains, the preparation and use thereof. 4,419,482., Cl. 524-560.000.
Theisen, Peter; and Riechert, Klaus-Dieter, to Biotronik Mess- und Therapiegerate GmbH & Co. Ingenieurburo Berlin. Intravenous pacemaker electrode. 4,418,704., Cl. 128-785.000.
Theuerkauf, Heinz: *See*—
Boning, Bernward; Nagel, Rudolf; Honig, Gunter; Kiencke, Uwe; and Theuerkauf, Heinz, 4,418,567., Cl. 73-35.000.

Thevenin, Jean-Claude P. H. P.: *See—*
Andre, Pierre A.; Thevenin, Jean-Claude P. H. P.; Girault, Jean-Pierre Y. B.; and Richter, Gerhard, 4,419,045., Cl. 415-119.000.

Thirion, Philippe: *See—*
Cholat-Namy, Jean; Huon, Simon; and Thirion, Philippe, 4,419,751., Cl. 370-13.000.

Thompson, Morice W.: *See—*
Backhouse, Alan J.; Bromley, Charles; and Thompson, Morice W., 4,419,465., Cl. 523-201.000.

Thompson, Roger D., to Boral (USA) Inc. Starter strip for a tile roof. 4,418,505., Cl. 52-95.000.

Thomson-CSF: *See—*
Georges, Jean-Francois M.; and Parus, Roger, 4,419,079., Cl. 434-43.000.
Micheron, Francois, 4,419,599., Cl. 310-311.000.
Spitz, Erich; and Micheron, Francois, 4,419,598., Cl. 310-311.000.
Volluet, Gerard; and Hartemann, Pierre, 4,419,637., Cl. 333-147.000.

Thomson, Timothy; and Peters, Ferman, to Dow Chemical Company, The. Method for controlling cellulose etherification reaction. 4,419,510., Cl. 536-84.000.

Throne, James L.: *See—*
Paschke, Edward E.; and Throne, James L., 4,419,462., Cl. 521-134.000.

Timashov, Grigory A.: *See—*
Bondarenko, Oleg P.; Genis, Igor A.; Baglai, Vitaly M.; Fedorovsky, Boris B.; Medovar, Boris I.; Timashov, Grigory A.; Us, Vasily I.; Pavlichenko, Georgy S.; and Sidorenko, Igor G., 4,418,741., Cl. 164-454.000.

Tohoku Metal Industries, Ltd.: *See—*
Sato, Yoshiro, 4,419,628., Cl. 328-67.000.

Tokes, Szabolcs: *See—*
Markus Lenk, Attila; Podmaniczky, Andras; and Tokes, Szabolcs, 4,419,676., Cl. 346-108.000.

Tokico Ltd.: *See—*
Tateoka, Kiyoshi; and Hayashida, Yoshihiro, 4,418,611., Cl. 91-369.00A.

Tokunaga, Mototsugu, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Production of polyurethane foams. 4,419,457., Cl. 521-65.000.

Tokyo Electric Co., Ltd.: *See—*
Takahashi, Yasuyoshi; Sakiguchi, Shigeo; and Sato, Teruyoshi, 4,419,738., Cl. 364-900.000.

Tokyo Keiki Company Ltd.: *See—*
Takahashi, Mutsumi; Uwabe, Toshio; Nagase, Toshio; Sato, Shosuke; and Matsuzawa, Hideshi, 4,419,572., Cl. 235-69.000.

Tokyo Sanyo Electric Co., Ltd.: *See—*
Kishi, Hiroyasu; Sakamoto, Junji; and Kondou, Sadao, 4,419,541., Cl. 381-7.000.
Okuyama, Yasuhiko; and Takezono, Takashi, 4,419,017., Cl. 368-64.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Haginomori, Eiichi, 4,419,552., Cl. 200-144.0AP.
Irokawa, Shoichi; Imai, Koji; Sakurai, Takeichi; and Goto, Kiyoshi, 4,419,591., Cl. 307-45.000.
Iwai, Hiroshi, 4,418,467., Cl. 29-574.000.
Izume, Takatomo; and Okado, Chihiro, 4,419,559., Cl. 219-110.000.
Kasori, Mituo; Takano, Takeshi; Maki, Hironori; and Ogino, Naohiko, 4,418,985., Cl. 350-96.340.
Kohara, Koujirou; and Miyano, Susumu, 4,419,307., Cl. 264-46.500.
Masuoka, Fujio, 4,419,682., Cl. 357-23.000.
Matsukawa, Naohiro, 4,419,142., Cl. 148-1.500.
Mitamura, Zenzou; Oosawa, Takashi; and Yonezawa, Akihiro, 4,419,602., Cl. 313-332.000.
Nokihara, Yutaka; Nakajyo, Hironori; and Yoshida, Kimio, 4,419,749., Cl. 369-11.000.
Oota, Hiroyuki; and Narita, Ryuuho, 4,418,614., Cl. 99-280.000.
Tanaka, Hiroshi; and Sakata, Fusao, 4,419,181., Cl. 156-640.000.
Wakamatsu, Hidekazu; and Kogure, Yoichiro, 4,418,539., Cl. 60-646.000.
Yamaura, Mitsuru; Kondow, Ryotaro; Inagaki, Junichi; and Matsuzawa, Kunio, 4,419,737., Cl. 364-900.000.

Tokyo Tanabe Co. L.T.D.: *See—*
Kamibayashi, Masato; Tsuchiya, Shinji; and Hiratsuka, Kozo, 4,419,518., Cl. 546-279.000.

Tollefsen, Kjell T.; and Nordquist, Albert W., to Pratt-Read Corporation. Keyboard for musical instrument. 4,418,605., Cl. 84-434.000.

Tomari, Yukio: *See—*
Sakano, Hajime; Nakai, Fumio; and Tomari, Yukio, 4,419,491., Cl. 525-67.000.

Tominaga, Shinji; Imura, Toshinori; and Nakamura, Ikushi, to Minolta Camera Kabushiki Kaisha. Motor driven film wind-up and rewind device for cameras. 4,419,001., Cl. 354-173.100.

Tominari, Noboru; and Ishida, Takashi, to Mikuni Kogyo Co., Ltd.; and Noboru Tominari. Electronic control fuel injection system for spark ignition internal combustion engine. 4,418,673., Cl. 123-478.000.

Toncsev, Eva, nee Ravasz: *See—*
Kosoczky, Ibolya; Toncsev, Eva, nee Ravasz; Benko, Pal; Pallos, Laszlo; Petocz, Lujza; Batori, Sandor; Hajos, Gyorgy; Messmer, Andras; and Grasser, Katalin, 4,419,355., Cl. 424-249.000.

Tong, Shih Y.: *See—*
Cheng-Quispe, Enrique; Dennis, Thomas M.; Fulcomer, Emanuel J., Jr.; Malek, George; and Tong, Shih Y., 4,419,756., Cl. 375-7.000.

Top-Element Bauelemente fur Innenausbau and Raumgestaltung GmbH & Co. KG: *See—*
Langenhorst, Gunter; and Langenhorst, Christoph, 4,418,746., Cl. 165-76.000.

Toray Industries: *See—*
Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, 4,419,389., Cl. 427-294.000.

Torii, Michihiro; and Kobayashi, Hiroaki, to Fuji Electrochemical Co., Ltd. Method of producing a stator yoke of a small-sized motor. 4,418,471., Cl. 29-596.000.

Toshiba Ceramics Co., Ltd.: *See—*
Reiji, Oguma; and Akihiro, Hirai, 4,419,118., Cl. 65-18.200.

Toshiba Silicones Limited: *See—*
Kosaka, Shuhei; and Fujii, Toshihiro, 4,419,254., Cl. 252-37.000.

Toshin Kogyo Co. Ltd.: *See—*
Ichinose, Shiro; Machida, Saneto; Murakami, Shotoku; and Furusawa, Teruo, 4,419,613., Cl. 318-632.000.

Totec Co. Ltd.: *See—*
Takahashi, Mutsumi; Uwabe, Toshio; Nagase, Toshio; Sato, Shosuke; and Matsuzawa, Hideshi, 4,419,572., Cl. 235-69.000.

Tottey, Robert. Amusement device. 4,418,912., Cl. 273-138.00R.

Toyo Boseki Kabushiki Kaisha: *See—*
Etoh, Kuniomi; Tanaka, Toshikiyo; Katoh, Yoshio; Sugiura, Takeo; Itoh, Yoshiyasu; and Kohira, Takeo, 4,419,438., Cl. 430-275.000.
Ichikawa, Rinjiro; and Hitomi, Chiyoji, 4,419,399., Cl. 428-215.000.

Toyoda, Kazuhiro; and Ono, Chikai, to Fujitsu Limited. Semiconductor memory device. 4,419,745., Cl. 365-174.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Atsumi, Tomiaki; Kuse, Kazumasa; and Deto, Junji, 4,418,898., Cl. 267-63.00R.
Donomoto, Tadashi; Tanaka, Atsuo; Okada, Masahiro; Kitamura, Atsushi; and Kyono, Tetsuyuki, 4,419,389., Cl. 427-294.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Katagiri, Masayoshi; Nomura, Yoshihisa; Kawaguchi, Hiroshi; Nishina, Shuho; and Miura, Eiji, 4,418,964., Cl. 303-6.00C.
Nagase, Masaomi, 4,418,665., Cl. 123-339.000.
Yamauchi, Yasutaka; and Itou, Hiroshi, 4,418,666., Cl. 123-339.000.

Tran, Luan G.: *See—*
Jalali, Bijan; and Tran, Luan G., 4,418,917., Cl. 273-313.000.

Trane CAC, Inc.: *See—*
Sawyer, George N., 4,418,548., Cl. 62-175.000.

Transformatoren Union Aktiengesellschaft: *See—*
Herzog, Max, 4,419,647., Cl. 336-92.000.

Transkrit Corporation: *See—*
Bowen, Charles G., 4,418,865., Cl. 229-69.000.

Trautenberg, Elmar: *See—*
Hundt, Eckart; and Trautenberg, Elmar, 4,418,575., Cl. 73-607.000.

TRD Inc.: *See—*
Heinrich, Charles E., 4,418,538., Cl. 60-646.000.

TRE Semiconductor Equipment Corporation: *See—*
Heimer, Richard J., 4,419,013., Cl. 356-400.000.

Tri Tool Inc.: *See—*
Astle, William H., 4,418,591., Cl. 82-4.00C.

Trierweiler, Charles M.: *See—*
Sullivan, Floyd A.; Elbers, Arthur H.; and Trierweiler, Charles M., 4,418,938., Cl. 280-661.000.

Trosky, William J.; Eichler, Kenneth M.; Mandel, Alan F.; and Moore, William H., to Westinghouse Electric Corp. Elevator servicing methods and apparatus. 4,418,795., Cl. 187-29.00R.

Trudeau, William H., to Gulf & Western Manufacturing Company. Bellows seal for ball and socket joints. 4,419,027., Cl. 403-134.000.

Trukenbrod, Karl: *See—*
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,419,458., Cl. 521-56.000.

TRW Inc.: *See—*
Rabe, William T.; and Roberts, Maurice P., 4,418,781., Cl. 180-155.000.
Slager, Donald M.; and Barker, William C., 4,419,669., Cl. 343-18.00D.

Tsuchiya, Shinji: *See—*
Kamibayashi, Masato; Tsuchiya, Shinji; and Hiratsuka, Kozo, 4,419,518., Cl. 546-279.000.

Tsuchiya, Shozo; Oshima, Akio; and Hayashi, Hideo, to Nippon Oil Company, Limited. Process for producing novel hydrogenated resin from five-member cyclic compounds having a conjugated double bond and/or Diels-Alder addition products thereof. 4,419,497., Cl. 525-338.000.

Tsuzurabara, Mamoru; and Kitakaze, Seiji, to Hitachi, Ltd. Magnetron. 4,419,606., Cl. 315-39.510.

Tubaro, Bruno. Plug valve. 4,418,887., Cl. 251-152.000.

Turco, Vincenzo; and Pompili, Antonio, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for forming projectiles for smooth bore shooting guns. 4,419,318., Cl. 264-274.000.

Turner, William D. Transfer organ. 4,418,602., Cl. 84-1.260.

Twin Disc, Incorporated: *See—*
Condon, William T., 4,419,086., Cl. 464-14.000.

Tyler, Derek E.: *See—*
Pryor, Michael J.; Tyler, Derek E.; and Yarwood, John C., 4,419,177., Cl. 156-601.000.

Tyryshkina, Galina B.: *See—*
Vasiliev, Boris P.; Borisov, Nikolai L.; Semenov, Mikhail K.; Ponomarev, Ivan K.; Tyryshkina, Galina B.; and Gorbatenko, Igor V., 4,418,749., Cl. 165-139.000.

Ueshima, Michio; Takahashi, Yoshiyuki; Kitada, Ritsuo; and Nagai, Isao, to Nippon Shokubai Kagaku Kogyo Co. Ltd. Oxidation catalyst. 4,419,270., Cl. 502-209.000.
Uitz, Mark O.: *See—*
Satchell, Fred E.; Cornell, William D.; Uitz, Mark O.; and Walker, Clarence L., 4,418,580., Cl. 73-864.130.
Ulith, Peter: *See—*
Klemm, Dieter; and Ulith, Peter, 4,419,047., Cl. 415-150.000.
Umezawa, Hidetsugu: *See—*
Chiba, Yoshiharu; Umezawa, Hidetsugu; Sakabe, Takao; and Arai, Ryuji, 4,418,729., Cl. 139-452.000.
Unibra Societe Anonyme: *See—*
Teyssie, Philippe J.; Jerome, Robert J.; and Broze, Guy J., 4,419,482., Cl. 524-560.000.
Union Carbide Corporation: *See—*
Bhasin, Madan M.; and Warner, Glenn H., 4,419,276., Cl. 502-347.000.
Leger, Violeta Z.; and Evans, William P., 4,419,422., Cl. 429-194.000.
Leger, Violeta Z., 4,419,423., Cl. 429-197.000.
Union Oil Company of California: *See—*
Miller, J. Wayne; and Ward, John W., 4,419,224., Cl. 208-244.000.
Ward, John W., 4,419,271., Cl. 502-65.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Gibson, Ian P., 4,419,202., Cl. 204-192.00N.
Puffett, Alan W., 4,419,731., Cl. 364-428.000.
United Sprinkler, Inc.: *See—*
Merkel, Jerome P., 4,418,757., Cl. 169-54.000.
United States Borax & Chemical Corporation: *See—*
Campbell, George W.; and Muench, Jerome T., 4,419,387., Cl. 427-215.000.
United States of America
Agriculture: *See—*
Hoffman, Jarett D., 4,418,647., Cl. 119-1.000.
Walker, Harrell L., 4,419,120., Cl. 71-79.000.
Air Force: *See—*
Beal, George W., 4,418,531., Cl. 60-261.000.
Frankel, Milton B.; and Witucki, Edward F., 4,419,285., Cl. 260-349.000.
Reiner, Richard W., 4,419,595., Cl. 307-355.000.
Starke, Roy R., 4,418,716., Cl. 137-605.000.
Witucki, Edward F.; and Flanagan, Joseph E., 4,419,286., Cl. 260-349.000.
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Kress, Kenneth A., 4,419,578., Cl. 250-390.000.
Army: *See—*
Cuneo, Andrew A., Jr.; and Loftus, James J., 4,419,622., Cl. 324-57.00R.
Grinwald, Israel M., 4,418,852., Cl. 224-42.230.
Holmes, Allen B., 4,418,721., Cl. 137-810.000.
Piedmont, James R.; and Hacskaylo, Michael, 4,418,466., Cl. 29-572.000.
Health and Human Services: *See—*
Howley, Peter M.; Sarver, Nava; and Law, Ming-Fan, 4,419,446., Cl. 435-68.000.
Kolobow, Theodor; and Ito, Yoichiro, 4,419,089., Cl. 494-45.000.
National Aeronautics and Space Administration: *See—*
Garner, H. Douglas, 4,418,480., Cl. 33-349.000.
Kendall, James M.; and Walsh, John V., 4,418,722., Cl. 138-42.000.
Navy: *See—*
Foster, John S.; and Zehmer, John A. M., III, 4,418,622., Cl. 102-307.000.
Gilbert, Paul H., 4,419,630., Cl. 329-50.000.
Holtrop, John W., 4,418,610., Cl. 91-368.000.
Horton, Tommy A.; and Augustyn, Michael D., 4,419,230., Cl. 210-114.000.
Madigosky, Walter M.; and Lee, Gilbert F., 4,418,573., Cl. 73-574.000.
Reindel, John, 4,419,635., Cl. 333-116.000.
Severns, James G., 4,419,532., Cl. 136-253.000.
Wagaman, Kerry L.; Clark, Chester F.; Henderson, Larry D.; and Jones, W. Steven, 4,419,155., Cl. 149-109.600.
U.S. Philips Corporation: *See—*
Boer, Kornelis; and De Widt, Hugo, 4,419,719., Cl. 362-218.000.
Frima, Heico J.; and Le Poole, Jan B., 4,419,561., Cl. 219-121.0EB.
Kuhl, Walter H.; Van Leunen, Johannes A. J.; van der Eijk, Bart; van der Bolt, Antonius J. J. M.; and Hoeberechts, Arthur M. E., 4,418,452., Cl. 445-35.000.
Kuindersma, Pieter I., 4,419,545., Cl. 179-111.00E.
Liefkens, Adrianus C. H. J.; and Notenboom, Gerardus J. A. M., 4,419,415., Cl. 428-594.000.
Nussli, Jacques; Marandas, Georges J. P.; and Farrayre, Antoine, 4,419,603., Cl. 313-346.00R.
Schmitz, Albert, 4,419,681., Cl. 357-13.000.
Sonnenberger, Paul; Graffenberger, Wilhelm; Cense, Adriaan; and Van Westen, Petrus A. M., 4,419,752., Cl. 370-29.000.
United Technologies Corporation: *See—*
Faucher, Joseph E.; Wright, Richard R.; Pane, Francis C., Jr.; Kwoka, David; and Striebel, Edmund E., 4,418,543., Cl. 60-742.000.
Gupta, Dinesh K.; and Duvall, David S., 4,419,416., Cl. 428-656.000.
Patterson, Robert J., II, 4,419,061., Cl. 425-8.000.
Slaughter, Edward R., 4,419,130., Cl. 75-244.000.
University of California, The Regents of the: *See—*
Dauben, William G.; and Brookhart, Todd E., 4,419,287., Cl. 260-397.100.
University of Delaware: *See—*
Yolles, Seymour, 4,419,340., Cl. 424-19.000.
University of Georgia Research Foundation, Inc.: *See—*
Cormier, Milton J., 4,419,366., Cl. 424-321.000.
University of Manchester Institute of Science and Technology, The: *See—*
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., 4,419,243., Cl. 210-618.000.
University of Southern Mississippi: *See—*
Gooch, Jan W.; Bufkin, B. George; and Wildman, Gary C., 4,419,139., Cl. 106-252.000.
UOP Inc.: *See—*
Asselin, George F., 4,419,226., Cl. 208-325.000.
Urschel, Joe R.: *See—*
Fischer, Robert R.; and Urschel, Joe R., 4,419,414., Cl. 428-575.000.
Urschel Laboratories, Incorporated: *See—*
Fischer, Robert R.; and Urschel, Joe R., 4,419,414., Cl. 428-575.000.
Urushida, Yoshihisa: *See—*
Koni, Tsuyoshi; and Urushida, Yoshihisa, 4,418,723., Cl. 138-42.000.
Us, Vasily I.: *See—*
Bondarenko, Oleg P.; Genis, Igor A.; Baglai, Vitaly M.; Fedorovsky, Boris B.; Medovar, Boris I.; Timashov, Grigory A.; Us, Vasily I.; Pavlichenko, Georgy S.; and Sidoremko, Igor G., 4,418,741., Cl. 164-454.000.
USM Corporation: *See—*
Hanson, Raymond, 4,419,393., Cl. 427-430.100.
Usui, Yoshihiro: *See—*
Ohshita, Masayuki; Horiuchi, Toshiaki; Yamanaka, Takashi; and Usui, Yoshihiro, 4,419,553., Cl. 200-144.00B.
Utsumi, Hiroshi: *See—*
Sasaki, Yutaka; Mori, Kunio; Moriya, Kiyoshi; and Utsumi, Hiroshi, 4,419,267., Cl. 502-26.000.
Uwabe, Toshio: *See—*
Takahashi, Mutsumi; Uwabe, Toshio; Nagase, Toshio; Sato, Shosuke; and Matsuzawa, Hideshi, 4,419,572., Cl. 235-69.000.
Uyeda, Tim M., to La Gard, Inc. Cylinder type lock and key. 4,418,555., Cl. 70-366.000.
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Vandenburgh, Garret K. Vehicle tire. 4,418,736., Cl. 152-354.00R.
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Schultz, Steven C.; and Vaughn, Thomas A., 4,418,951., Cl. 292-202.000.

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Kuhnert, Lothar; Costisella, Burkhard; Roth, Christoph; Kroha, Walter; Baumbach, Wolfgang; and Hoppe, Renate, 4,419,440., Cl. 430-377.000.
Lischewski, Regina, geb. Werndl; Marx, Jorg; Walter, Reinhard; and Mockel, Peter, 4,419,431., Cl. 430-179.000.

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Asmundsson, Einar; Hart, Robert P.; and Fleischer, Donald W., 4,418,571., Cl. 73-304.00C.

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Karger, Robert, 4,419,334., Cl. 423-240.000.

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Shiraishi, Yuma; and Oota, Yoshihiko, 4,419,698., Cl. 358-330.000.
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Johansson, Lennart R.; and Hillstrom, Ernst G. K., 4,418,997., Cl. 353-111.000.

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Vora, Madhukar B.; and Hingarh, Hermaj K., to Fairchild Camera & Instrument Corporation. Process for fabricating a logic structure utilizing polycrystalline silicon Schottky diodes. 4,418,468., Cl. 29-577.00C.

Voss, Earl W., to Diversified Electronics, Inc. Sequencer for pump motors or the like. 4,419,590., Cl. 307-41.000.

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W. L. Gore & Associates, Inc.: *See*—
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Becker, Michael; Fendt, Alfons; Povh, Dusan; Renz, Klaus; Schuch, Gerhard; and Waldmann, Hermann, 4,419,621., Cl. 324-51.000.

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Bromley, James E.; Dees, John R.; Familant, Harold M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,419,313., Cl. 264-167.000.

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Stephenson, Michael D.; and Waller, Winston A., 4,419,012., Cl. 356-141.000.

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Wang, Minchen, to Photovolt Corporation. Polarographic electrode. 4,419,210., Cl. 204-403.000.
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Ward, John W., to Union Oil Company of California. Hydrocarbon conversion catalyst. 4,419,271., Cl. 502-65.000.
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Warner Lambert Technologies, Inc.: *See*—
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Warner, Sylvia: *See*—
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Warren, Hollie B., Jr.; and Paulley, Thomas A., to Exxon Production Research Co. Ice thickness inductor probe. 4,418,570., Cl. 73-304.00R.
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Watts, Abner W. Trash container apparatus. 4,418,835., Cl. 220-404.000.
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Weaver, Max A.: *See*—
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Weirick, Richard A. Drive unit for golf bag cart. 4,418,776., Cl. 180-19.00H.
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Anderson, Vincent P., 4,419,059., Cl. 418-150.000.
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Wilkinson, James H., to Sony Corporation. Error concealment in digital television signals. 4,419,693., Cl. 358-167.000.

Willard, Miles J.; and Englar, William J., to Willard, Miles J. Process for forming a potato patty. 4,419,375., Cl. 426-272.000.

Willi, Rauschert; Erich, Bock; and Gerald, Rieger, to Diehl GmbH & Co. Aerodynamic braking arrangement for projectile components which are to be salvaged. 4,418,624., Cl. 102-473.000.

Williams, Charles L. Method and apparatus for controlling propeller pitch. 4,419,050., Cl. 416-46.000.

Williams, Debra: *See*—
Coran, Aubert Y.; Patel, Raman; and Williams, Debra, 4,419,499., Cl. 525-424.000.

Williams, Gary S., to Phillips Cables Ltd. Splice organizer. 4,418,982., Cl. 350-96.200.

Williams, John V.: *See*—
Molaire, Michel F.; and Williams, John V., 4,419,434., Cl. 430-207.000.

Williams, Raymond S.; and Fisher, Paul C., to Fisher, Paul C. Erasable ink for ball point pens. 4,419,464., Cl. 523-161.000.

Williamson Company, The: *See*—
Ionna, Samuel A., 4,418,943., Cl. 285-12.000.

Williamson, Thomas B.: *See*—
Letchworth, Peter E.; and Williamson, Thomas B., 4,419,350., Cl. 424-225.000.

Willke, Herbert L., Jr.: *See*—
Gorchev, Dimiter; Ingard, Karl U.; and Willke, Herbert L., Jr., 4,418,788., Cl. 181-224.000.

Wills, James C.; and Spenser, Douglas S., to Solitec, Inc. Apparatus for treating semiconductor wafers. 4,418,639., Cl. 118-50.000.

Wilson, Thomas G., Jr., to Bell Telephone Laboratories, Incorporated. Regulation of multiple-output DC-DC converters. 4,419,723., Cl. 363-21.000.

Winans, Luther, Jr.: *See*—
Garner, Richard L.; and Winans, Luther, Jr., 4,419,451., Cl. 435-298.000.

Winchell, David A., to Baxter Travenol Laboratories, Inc. Method for manufacturing a plastic container with non-coring penetrable wall portion. 4,419,323., Cl. 264-523.000.

Windsor, Harry M., to Automotive Products Limited. Clutch control system. 4,418,810., Cl. 192-0.076.

Winkelman, Henry T., Jr.; and Huckaby, Edward E. Waffle furniture system. 4,418,967., Cl. 312-107.000.

Winkler, Siegfried: *See*—
Kalthoff, Jorg F.; and Winkler, Siegfried, 4,418,563., Cl. 73-12.000.

Wion, Donald A.: *See*—
Brown, Christopher K.; and Wion, Donald A., 4,418,453., Cl. 29-33.00M.

Wishart, John D. Split cycle internal combustion engines. 4,418,657., Cl. 123-68.000.

Wismer, Marco; and Bosso, Joseph F., to PPG Industries, Inc. Process for the preparation of cationic resins, aqueous, dispersions, thereof, and electrodeposition using the aqueous dispersions. 4,419,467., Cl. 523-414.000.

Witthaus, Martin: *See*—
Reuter, Herbert; Saran, Herbert, deceased; and Witthaus, Martin, 4,419,260., Cl. 252-174.130.

Witucki, Edward F.; and Flanagan, Joseph E., to United States of America, Air Force. Azido esters. 4,419,286., Cl. 260-349.000.

Witucki, Edward F.: *See*—
Frankel, Milton B.; and Witucki, Edward F., 4,419,285., Cl. 260-349.000.

WNY Hospital Television, Inc.: *See*—
Vesterling, Friedrich, 4,419,694., Cl. 358-181.000.

Wolff, Robert C. Hinge means and luggage combined therewith. 4,418,805., Cl. 206-279.000.

Wolfgang, Bergstein; Friedrich, Heinz; Kleemann, Axel; Prescher, Gunther; and Beschke, Helmut, to Degussa AG. Catalysts for the production of 2-cyanopyrazine. 4,419,272., Cl. 502-84.000.

Wolfgang, Gunter, to Neiman S.A. Key operated locking mechanism. 4,418,554., Cl. 70-360.000.

Wolfson, William; Grondstra, Jan W.; and Jarva, Curt, to Indata Corporation. Inventory control system. 4,419,734., Cl. 364-567.000.

Wolters, Tjako A.; Goedegebuure, Gerard W. H.; de Witt, Bartholomeus M.; and Veltman, Constantius H. M., to Ballast-Nedam Groep N.V.; Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast Dredging) B.V.; and Scheepswerf en Machinefabriek "De Liesbosch" B.V. Method of dredging and dredging implement. 4,418,484., Cl. 37-63.000.

Wong, Hee: *See*—
Russell, Gilbert E.; and Wong, Hee, 4,419,689., Cl. 358-37.000.

Wong, Steven S.: *See*—
LaPierre, Rene B.; Partridge, Randall D.; Chen, Nai Y.; and Wong, Steven S., 4,419,220., Cl. 208-111.000.

Woodier, James G., to Teletype Corporation. Flexible band positioning device for a read/write head. 4,419,707., Cl. 360-106.000.

Woodman Company, The: *See*—
Henry, Nelson R.; Cutler, Duncan B.; and Warner, William L., 4,418,771., Cl. 177-1.000.

Woods, Walter: *See*—
Nahra, John E.; and Woods, Walter, 4,419,301., Cl. 261-118.000.

Woods, William D.; and Pigman, John H., to International Design Corporation. Vise system. 4,418,901., Cl. 269-71.000.

Woolnough, James; Gardner, Bruce; and May, David A., to Appropriate Technology Corporation. Insulating window covering. 4,418,739., Cl. 160-120.000.

Workman, Theodore W. Heat recovery. 4,418,866., Cl. 237-55.000.

Wotier, Edward: *See*—
Nelsen, Suzanne; Ozari, Yehuda; Alwani, Dru; and Wotier, Edward, 4,419,471., Cl. 524-100.000.

Wright, Kenneth W.: *See*—
Hersom, Albert C.; Wright, Kenneth W.; and Brittain, John E., 4,419,376., Cl. 426-402.000.

Wright, Richard R.: *See*—
Faucher, Joseph E.; Wright, Richard R.; Pane, Francis C., Jr.; Kwoka, David; and Striebel, Edmund E., 4,418,543., Cl. 60-742.000.

Wu, Tsun Z. Locking device of an automatic opening umbrella. 4,418,707., Cl. 135-24.000.

Wulz, Helmut: *See*—
Heimberger, Helmut; and Wulz, Helmut, 4,418,449., Cl. 24-401.000.

Wyatt, Richard J., to Kinetic Systems, Inc. Sleep-inducing pharmaceutical composition and method. 4,419,345., Cl. 424-153.000.

Wyatt, William G., to Vapor Energy, Inc. System for heating and utilizing fluids. 4,418,651., Cl. 122-31.00R.

Wycoff, Keith H.; and Dittmer, William H., to Wycoff, Keith H. Signal absence detector. 4,419,765., Cl. 455-36.000.

Wysocki, Joseph A.; Blair, George R.; and Vince, Michael R., to Hughes Aircraft Company. Multiply coated metallic clad fiber optical waveguide. 4,418,984., Cl. 350-96.330.

Xerox Corporation: *See*—
Garavuso, Gerald M., 4,418,905., Cl. 271-98.000.
Kingsley, William, 4,419,007., Cl. 355-14.0SH.
Knights, John C., 4,418,645., Cl. 118-715.000.
Lorenze, Robert V., Jr., 4,418,472., Cl. 29-603.000.
Sheridon, Nicholas K.; Biegelsen, David K.; and Berkovitz, Michael A., 4,419,680., Cl. 346-163.000.

Xomox Corporation: *See*—
Krause, Bernd, 4,418,889., Cl. 251-306.000.

Yabuta, Keiichiro: *See*—
Ito, Hideo; and Yabuta, Keiichiro, 4,418,780., Cl. 180-142.000.

Yagi, Hiroyuki; and Baba, Takashi, to Sony Corporation. Wrist AM radio receiver. 4,419,770., Cl. 455-301.000.

Yamada, Minoru: *See*—
Kuwazima, Shigeru; Kato, Eiichi; and Yamada, Minoru, 4,419,439., Cl. 430-375.000.

Yamaguchi, Koichi: *See*—
Tanaka, Masaki; and Yamaguchi, Koichi, 4,419,391., Cl. 427-387.000.

Yamah Motor Co., Ltd.: *See*—
Nakazima, Masatoshi, 4,418,782., Cl. 180-190.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Taguchi, Michihiro, 4,419,083., Cl. 440-56.000.

Yamamoto, Junji; and Harada, Shingo, to Aisin Seiki Kabushiki Kaisha; and Kanto Jidosha Kogyo Kabushiki Kaisha. Edge trim and weather seal assembly. 4,418,956., Cl. 296-216.000.

Yamamoto, Masanobu, to B. C. Research Council. Fish canning process. 4,419,370., Cl. 426-7.000.

Yamamoto, Mitsuo; Namazugoshi, Takeo; and Seto, Hiroyoshi, to Osaka Gas, Ltd. Pipeline coating method. 4,419,163., Cl. 156-94.000.

Yamamoto, Yoshihiro; Hongu, Masayuki; Ohmuro, Shigeru; and Kawakami, Hiromi, to Sony Corporation. Television sound receiver. 4,419,695., Cl. 358-198.000.

Yamanaka, Takashi: *See*—
Ohshita, Masayuki; Horiuchi, Toshiaki; Yamanaka, Takashi; and Usui, Yoshihiro, 4,419,553., Cl. 200-144.00B.

Yamanaka, Tohr; and Imai, Takashi, to Takasago Perfumery Co., Ltd. Process for producing polycondensates of ω-oxypentadecanoic acid. 4,419,292., Cl. 260-410.90R.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Imai, Kazuhiro; Tamura, Zenzo; and Kobayashi, Shin-ichiro, 4,419,452., Cl. 436-89.000.

Yamashita, Sadahiko; and Saito, Mitsuo, to Matsushita Electric Industrial Company, Limited. Wideband tuner for VHF, CATV and UHF television signals. 4,419,768., Cl. 455-180.000.

Yamato, Akihiro: *See*—
Hasegawa, Shumpei; and Yamato, Akihiro, 4,418,674., Cl. 123-491.000.

Yamauchi, Yasutaka; and Itou, Hiroshi, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Device for controlling the idling speed of an engine. 4,418,666., Cl. 123-339.000.

Yamaura, Mitsuru; Kondow, Ryotaro; Inagaki, Junichi; and Matsuzawa, Kunio, to Tokyo Shibaura Denki Kabushiki Kaisha. Setting device for protective control system. 4,419,737., Cl. 364-900.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Method of making magnetic material layer. 4,419,381., Cl. 427-39.000.

Yanai, Tokiyoshi: *See*—
Nakayama, Masafumi; Yanai, Tokiyoshi; and Fukino, Masato, 4,418,779., Cl. 180-141.000.
Yannas, Ioannis V.; Burke, John F.; Orgill, Dennis P.; and Skrabut, Eugene M., to Massachusetts Institute of Technology. Method of promoting the regeneration of tissue at a wound. 4,418,691., Cl. 128-156.000.
Yano, Takemitu: *See*—
Yoshida, Shin-ichi; Yano, Takemitu; and Higashi, Hidehiro, 4,419,275., Cl. 502-322.000.
Yantz, Rupert O.: *See*—
Gregoire, Brian R.; and Yantz, Rupert O., 4,419,721., Cl. 362-368.000.
Yanutola, Michael J., to Sun Chemical Corporation. Process for preparing water-in-oil emulsions. 4,419,483., Cl. 524-701.000.
Yarwood, John C.: *See*—
Pryor, Michael J.; Tyler, Derek E.; and Yarwood, John C., 4,419,177., Cl. 156-601.000.
Yata, Yukio; and Inagaki, Koichi, to Mitsubishi Rayon Co., Ltd. Rear projection screen. 4,418,986., Cl. 350-128.000.
Yissum Research Development Company of the Hebrew University of Jerusalem: *See*—
Dikstein, Shabtay; and Segal, Mark, 4,419,367., Cl. 424-330.000.
Yokota, Hiroshi: *See*—
Nakahara, Motohiro; Yoshioka, Naoki; Yokota, Hiroshi; Miyajiri, Tetsuo; and Watanabe, Minoru, 4,419,116., Cl. 65-3.120.
Yolles, Seymour, to University of Delaware. Controlled release of anticancer agents from biodegradable polymers. 4,419,340., Cl. 424-19.000.
Yonekura, Hiroto: *See*—
Murakami, Ryoichi; Shimizu, Hideo; Yoshii, Takashi; Ishida, Minoru; and Yonekura, Hiroto, 4,419,147., Cl. 148-31.500.
Yonezawa, Akihiro: *See*—
Mitamura, Zenzou; Oosawa, Takashi; and Yonezawa, Akihiro, 4,419,602., Cl. 313-332.000.
Yonker, John H.; and Arendt, Henry P., to Otis Engineering Corporation. Method and apparatus for performing operations in well tubing. 4,418,756., Cl. 166-383.000.
Yoo, Kwang-Keun: *See*—
Kim, Ki-Hwan; Yoo, Kwang-Keun; and Lee, Tae-Ho, 4,418,706., Cl. 131-296.000.
Yoon, Heeyoung, to Conoco Inc. Alcohol fuel dual-catalyst treatment apparatus and method. 4,418,653., Cl. 123-3.000.
Yoshida, Fumio; Miki, Yukio; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Camera capable of automatic film advancing and rewinding. 4,419,000., Cl. 354-173.100.
Yoshida, Kimio: *See*—
Nokihara, Yutaka; Nakajyo, Hironori; and Yoshida, Kimio, 4,419,749., Cl. 369-11.000.
Yoshida Kogyo K. K.: *See*—
Ishihara, Kiyomitsu, 4,419,306., Cl. 264-40.500.
Yoshida, Shin-ichi; Yano, Takemitu; and Higashi, Hidehiro, to Catalysts & Chemicals Industries Co., Ltd. Method of hydrorefining catalyst manufacture. 4,419,275., Cl. 502-322.000.
Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,419,710., Cl. 360-133.000.
Yoshii, Takashi: *See*—
Murakami, Ryoichi; Shimizu, Hideo; Yoshii, Takashi; Ishida, Minoru; and Yonekura, Hiroto, 4,419,147., Cl. 148-31.500.
Yoshikawa, Naoki: *See*—
Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, 4,419,643., Cl. 335-234.000.
Yoshimatsu, Shiro: *See*—
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; and Ozaki, Tsuyoshi, 4,419,128., Cl. 75-46.000.
Yoshimi, Kazuhiko; Shimizu, Kazuyuki; Watari, Takashi; and Kusumoto, Katsunori, to Nippon Kokan Kabushiki Kaisha; and Japan Marine Machinery Development Association. Method for operating a rigid marine sail. 4,418,632., Cl. 114-102.000.
Yoshimoto, Teruo: *See*—
Sugitani, Junichi; Yoshimoto, Teruo; and Takahashi, Makoto, 4,419,129., Cl. 420-584.000.
Yoshimura, Toru: *See*—
Ojima, Shin; Tada, Kiichiro; Yoshimura, Toru; Yoshikawa, Naoki; and Naito, Yoshinao, 4,419,643., Cl. 335-234.000.
Yoshioka, Naoki: *See*—
Nakahara, Motohiro; Yoshioka, Naoki; Yokota, Hiroshi; Miyajiri, Tetsuo; and Watanabe, Minoru, 4,419,116., Cl. 65-3.120.
Young, David A., to Exxon Research & Engineering Co. Electrolytic recovery of cobalt oxo catalysts. 4,419,195., Cl. 204-78.000.
Young, Jerry W., to Sealright Co. Inc. Object processing apparatus. 4,418,644., Cl. 118-669.000.
Young, John: *See*—
Jones, Gordon H.; and Young, John, 4,419,368., Cl. 424-331.000.
Younger Manufacturing Company: *See*—
Davenport, Lawrence J., deceased; and Davenport, Nancy, executrix, 4,418,992., Cl. 351-169.000.
Yu, Hong. Low frequency wide band signal coupler. 4,419,636., Cl. 333-131.000.
Yuill, Kenneth A.: *See*—
Davitt, Alan L.; and Yuill, Kenneth A., 4,419,154., Cl. 149-40.000.
Yusa, Yasuhiro: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryuzo; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,419,710., Cl. 360-133.000.
Zabko, Al L.: *See*—
DiGiacomo, Hector; Raos, Robert R.; and Zabko, Al L., 4,418,464., Cl. 29-564.600.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Ehrlinger, Friedrich; Dziuba, Peter; Maurer, Dieter; and Goeft, Manfred, 4,418,785., Cl. 180-255.000.
Zaidel, Simon A.: *See*—
Naster, Ronald J.; Zaidel, Simon A.; Hwang, Ying-Chen; Parks, Earl L.; and Cady, William R., 4,418,470., Cl. 29-577.00C.
Zajac, John, to Eaton Corporation. Load lock valve. 4,418,646., Cl. 118-733.000.
Zajer nee Balazs, Maria: *See*—
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.
Zato, Thomas J.: *See*—
Puskas, Jeffery A.; Skerlos, Peter C.; and Zato, Thomas J., 4,419,662., Cl. 340-750.000.
Zehmer, John A. M., III: *See*—
Foster, John S.; and Zehmer, John A. M., III, 4,418,622., Cl. 102-307.000.
Zenisek, Michael J.: *See*—
Finet, Alain; Nerone, Louis R.; and Zenisek, Michael J., 4,418,773., Cl. 177-16.000.
Zenith Radio Corporation: *See*—
Puskas, Jeffery A.; Skerlos, Peter C.; and Zato, Thomas J., 4,419,662., Cl. 340-750.000.
Ziegelmeyer, Lynn J. Elevatable grinding wheel motor support. 4,418,502., Cl. 51-166.0MH.
Zimmermann, Hanns; and Preisenhammer, Peter, to Saurer-Allma GmbH. Pneumatically driven clamping device, in particular a machine vice. 4,418,899., Cl. 269-32.000.
Ziolko, Francis J., to Devro, Inc. Method and apparatus for processing stuffed sausage casing. 4,418,447., Cl. 17-34.000.
Zoecon Corporation: *See*—
Greene, C. Lawrence; Creech, David C.; and Kelley, Donald W., 4,419,372., Cl. 426-104.000.
Zoltan, Bart J., to American Cyanamid Company. Device for indicating last medication usage. 4,419,016., Cl. 368-10.000.
Zoltan, Sandor: *See*—
Lindwurm, Ferenc; Muskovits, Jozsef; Zoltan, Sandor; Kolta, Rezso; Soos, Rudolf; Puskas, Tivadar; Somfai, Eva; and Hidasi, Gyorgy, 4,419,524., Cl. 562-506.000.
Zsadon, Bela: *See*—
Keve, Tibor; Fekete, Gyorgy; Lorincz, Csaba; Galambos, Janos; Zsadon, Bela; Zajer nee Balazs, Maria; Forgach, Lilla; Karpati, Egon; Kiraly, Arpad; Kiraly nee Soos, Gyongyver; Szporny, Laszlo; and Rosdy, Bela, 4,419,359., Cl. 424-256.000.
Zurek, Thomas E., to Midland-Ross Corporation. Welding control with automatic percent heat adjustment. 4,419,560., Cl. 219-117.100.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF DECEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aine, Harry E.: *See*—
Block, Barry, Re. 31,459., Cl. 338-47.000.

American Petro Mart, Inc.: *See*—
Carlson, Lee G., Re. 31,456., Cl. 210-676.000.

Avtex Fibers Inc.: *See*—
Bockno, Gregory C., Re. 31,457., Cl. 428-224.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. Re. 31,455., Cl. 71-115.000.

Beta S/A: *See*—
Olsen, Niels J.; and Weir, Henry J., Re. 31,453., Cl. 38-143.000.

Block, Barry, to Aine, Harry E.; and Block, Barry. Solid state force transducer and method of making same. Re. 31,459., Cl. 338-47.000.

Bockno, Gregory C., to Avtex Fibers Inc. Viscose rayon. Re. 31,457., Cl. 428-224.000.

British Broadcast Corporation: *See*—
Dalton, Christopher J.; and Roe, Graham D., Re. 31,460., Cl. 358-140.000.

Carlson, Lee G., to American Petro Mart, Inc. High capacity folded moving bed ion exchange apparatus and method for treating phosphoric acid. Re. 31,456., Cl. 210-676.000.

Dalton, Christopher J.; and Roe, Graham D., to British Broadcast Corporation. Method and apparatus for standards conversion of television signals. Re. 31,460., Cl. 358-140.000.

Hymes, Alan C., to LecTec Corporation. Monitoring and stimulation electrode. Re. 31,454., Cl. 128-641.000.

LecTec Corporation: *See*—
Hymes, Alan C., Re. 31,454., Cl. 128-641.000.

Nolte, Albert C., Jr.: *See*—
Trattner, Burton C., Re. 31,458., Cl. 429-100.000.

Olsen, Niels J.; and Weir, Henry J., to Beta S/A. Laundry feeding apparatus. Re. 31,453., Cl. 38-143.000.

Roe, Graham D.: *See*—
Dalton, Christopher J.; and Roe, Graham D., Re. 31,460., Cl. 358-140.000.

Rohm and Haas Company: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., Re. 31,455., Cl. 71-115.000.

Swithenbank, Colin: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., Re. 31,455., Cl. 71-115.000.

Trattner, Burton C., to Nolte, Albert C., Jr., a part interest. Adapter for dry cell batteries. Re. 31,458., Cl. 429-100.000.

Weir, Henry J.: *See*—
Olsen, Niels J.; and Weir, Henry J., Re. 31,453., Cl. 38-143.000.

Yih, Roy Y.: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., Re. 31,455., Cl. 71-115.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Anderson, Donald R.; and Frisque, Alvin J., to Nalco Chemical Company. Process for rapid dissolving water-soluble vinyl addition polymers using water-in-oil emulsions. B1 1,028,576., 12-6-83, Cl. 523-336.000.

Bell Telephone Laboratories, Incorporated: *See*—
Farmer, Wayne D.; and Newhall, Edmunde E., B1 3,597,549., Cl. 370-88.000.

Boys, John T., to Standard Pressed Steel Co. Apparatus for and method of determining rotational and linear stiffness. B1 3,982,419., 12-6-83, Cl. 73-862.240.

Farmer, Wayne D.; and Newhall, Edmunde E., to Bell Telephone Laboratories, Incorporated. High speed data communication system. B1 3,597,549., 12-6-83, Cl. 370-88.000.

Frisque, Alvin J.: *See*—
Anderson, Donald R.; and Frisque, Alvin J., B1 1,028,576., Cl. 523-336.000.

Keane, Francis X., to Kincoa, Ltd. Hospital Bed. B1 3,434,165., 12-6-83, Cl. 5-61.000.

Kincoa, Ltd.: *See*—
Keane, Francis X., B1 3,434,165., Cl. 5-61.000.

Nalco Chemical Company: *See*—
Anderson, Donald R.; and Frisque, Alvin J., B1 1,028,576., Cl. 523-336.000.

Newhall, Edmunde E.: *See*—
Farmer, Wayne D.; and Newhall, Edmunde E., B1 3,597,549., Cl. 370-88.000.

Okaya, Akira, to Patlex Corp. Dielectric microwave resonator. B1 3,237,132., 12-6-83, Cl. 333-211.000.

Patlex Corp.: *See*—
Okaya, Akira, B1 3,237,132., Cl. 333-211.000.

Standard Pressed Steel Co.: *See*—
Boys, John T., B1 3,982,419., Cl. 73-862.240.

LIST OF DESIGN PATENTEES

American District Telegraph Company: *See*—
Thornton, Hugh P., Jr., 271,671., Cl. D10-106.000.

American Standard Inc.: *See*—
De Graw, Kenneth J.; and Nickerson, Earl W., 271,707., Cl. D23-48.000.
DeGraw, Kenneth J.; and Nickerson, Earl W., 271,708., Cl. D23-48.000.
Fabian, Wolfgang, 271,705., Cl. D23-26.000.
Fabian, Wolfgang, 271,706., Cl. D23-32.000.

AMP Incorporated: *See*—
Casciotti, Albert; and Hollyday, Robert D., 271,685., Cl. D13-24.000.
Casciotti, Albert; and Hollyday, Robert D., 271,686., Cl. D13-24.000.

Au Equipment Associates, Ltd.: *See*—
Weir, James L., 271,697., Cl. D15-147.000.

Bachmann, G. Merle; Davis, Charles L.; and Crosby, Samuel C., to Coca-Cola Company, The. Beverage cart. 271,716., 12-6-83, Cl. D34-14.000.

Barclays Bank PLC: *See*—
Lutos, Matthew, 271,723., Cl. D99-41.000.

Basaldua, Tim, Jr. Flush mounted drawing implement holder. 271,638., 12-6-83, Cl. D6-113 000.

Batts, John H.; and Bredeveg, Robert, to John Thomas Batts, Inc. Body of a garment hanger. 271,649., 12-6-83, Cl. D6-253.000.

Bell Telephone Laboratories, Incorporated: *See*—
Bhat, Ghanshyam A.; Genaro, Donald M.; McGarvey, John N.; Stickler, Albert C.; Sylvester, Gordon E.; and Tyler, Daniel W., 271,691., Cl. D14-60.000.

Berry, William J., Jr., to Darco Water Systems, Inc. Combined conductivity monitor and controller. 271,684., 12-6-83, Cl. D13-11.000.

Bhat, Ghanshyam A.; Genaro, Donald M.; McGarvey, John N.; Stickler, Albert C.; Sylvester, Gordon E.; and Tyler, Daniel W., to Bell

Telephone Laboratories, Incorporated. Telephone stand. 271,691., 12-6-83, Cl. D14-60.000.
Boehm, Michael, to Rosenthal Aktiengesellschaft. Stem and a base of a bowl of a stemware glass. 271,653., 12-6-83, Cl. D7-39.000.
BOK Plastics, Inc.: *See*—
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33 M 4,418,453
90 B 4,418,454
156.8 H 4,418,455
157 C 4,418,456
157.4 4,418,457
237 4,418,458
239 4,418,459
403.3 4,418,460
407 4,418,461
426.4 4,418,462
527.4 4,418,463
564.6 4,418,464
566.1 4,418,465
572 4,418,466
574 4,418,467
577 C 4,418,468
4,418,469
4,418,470
596 4,418,471
603 4,418,472
4,418,473
612 4,418,474
842 4,418,475

CLASS 33

172 B 4,418,476
179 4,418,477
192 4,418,478
265 4,418,479
349 4,418,480

CLASS 34

1 4,418,481
20 4,418,482

CLASS 36

28 4,418,483

CLASS 37

63 4,418,484
244 4,418,485

CLASS 38

58 4,418,486
143 Re.31,453

CLASS 42

1 ST 4,418,487
75 B 4,418,488

CLASS 43

17 4,418,489
25.2 4,418,490
26.1 4,418,491
44.9 4,418,492
67 4,418,493

CLASS 44

53 4,419,105
62 4,419,106

CLASS 46

61 4,418,494
206 4,418,495

CLASS 47

41.12 4,418,496
67 4,418,497

CLASS 49

425 4,418,498

CLASS 51

3 4,418,499
125.5 4,418,500
157 4,418,501
166 MH 4,418,502
252 4,418,503

CLASS 52

12 4,418,504
95 4,418,505
209 4,418,506
241 4,418,507
282 4,418,508
693 4,418,509

CLASS 53

399 4,418,510
427 4,418,511
434 4,418,512
4,418,513
436 4,418,514
457 4,418,515

CLASS 55

5 4,419,107
97 4,419,108
192 4,419,109
356 4,419,110
388 4,419,111
480 4,419,112
484 4,419,113

CLASS 56

228 4,418,516
4,418,517
4,418,518
244 4,418,519
297 4,418,520
330 4,418,521

CLASS 57

80 4,418,522
207 4,418,523
239 4,418,524
264 4,418,525

CLASS 59

85 4,418,526

CLASS 60

39.05 4,418,527
39.161 4,418,528
39.181 4,418,530
39.281 4,418,529
261 4,418,531
316 4,418,532
520 4,418,533
585 4,418,534
602 4,418,535
4,418,536
611 4,418,537
646 4,418,538
4,418,539
649 4,418,540
667 4,418,541
668 4,418,542
742 4,418,543

CLASS 62

17 4,419,114
55 4,418,544
101 4,418,545
115 4,418,546
116 4,418,547
175 4,418,548
260 4,418,549

CLASS 65

3.12 4,419,115
4,419,116
16 4,419,117
18.2 4,419,118
39 4,419,119

CLASS 70

18 4,418,550
4,418,551
107 4,418,552
164 4,418,553
360 4,418,554
366 4,418,555

CLASS 71

79 4,419,120
92 4,419,121
98 4,419,122
4,419,123
4,419,124
115 Re.31,455

CLASS 72

62 4,418,556
69 4,418,557
177 4,418,558
201 4,418,559
296 4,418,560
406 4,418,561
444 4,418,562

CLASS 73

12 4,418,563
4,418,564
19 4,418,565
23 4,418,566
35 4,418,567
61.3 4,418,576
202 4,418,568
304 C 4,418,569
4,418,571
304 R 4,418,570
432 R 4,418,572
574 4,418,573
601 4,418,574
607 4,418,575
772 4,418,577
861.22 4,418,578
861.23 4,418,579
862.24 B1 73,982,419
864.13 4,418,580
864.34 4,418,581

CLASS 74

493 4,418,582
501.5 R 4,418,583
594.2 4,418,584
695 4,418,585
831 4,418,586
867 4,418,587

CLASS 75

0.5 B 4,419,125
10 R 4,419,126
4,419,127
46 4,419,128
244 4,419,130
257 4,419,131

CLASS 76

88 4,418,588
112 4,418,589

CLASS 81

467 4,418,590

CLASS 82

4 C 4,418,591
34 C 4,418,592
36 R 4,418,593

CLASS 83

19 4,418,594
55 4,418,595
98 4,418,596
478 4,418,597

CLASS 84

1.01 4,418,598
1.19 4,418,600
1.26 4,418,601
4,418,602
95 R 4,418,603
232 4,418,604
434 4,418,605

CLASS 86

31 4,418,606

CLASS 89

33 CA 4,418,607
193 4,418,608

CLASS 91

275 4,418,609
368 4,418,610
369 A 4,418,611
445 4,418,612

CLASS 92

98 D 4,418,613

CLASS 99

280 4,418,614
331 4,418,615
458 4,418,616
571 4,418,617

CLASS 101

68 4,418,618
269 4,418,619
350 4,418,620

CLASS 102

238 4,418,621
307 4,418,622
369 4,418,623
473 4,418,624

CLASS 104

9 4,418,625

CLASS 106

14.39 4,419,137
27 4,419,132
85 4,419,133
87 4,419,134
88 4,419,135
89 4,419,136
90 4,419,138
252 4,419,139
273 N 4,419,140

CLASS 108

8 4,418,626
91 4,418,627

CLASS 109

19 4,418,628

CLASS 112

146 4,418,629
261 4,418,630

CLASS 114

39 4,418,631
102 4,418,632
144 E 4,418,633
263 4,418,634
304 4,418,635

CLASS 116

28 R 4,418,636
70 4,418,637
87 4,418,638

CLASS 118

50 4,418,639
411 4,418,640
429 4,418,641
624 4,418,642
657 4,418,643
669 4,418,644
715 4,418,645
733 4,418,646

CLASS 119

1 4,418,647
2 4,418,648

CLASS 122

4 D 4,418,650
15 4,418,649
31 R 4,418,651
488 4,418,652

CLASS 123

3 4,418,653
25 A 4,418,654
41.82 R 4,418,655
58 AM 4,418,656
68 4,418,657
80 D 4,418,658
90.46 4,418,659
143 B 4,418,660
145 A 4,418,661
198 D 4,418,662
243 4,418,663
273 4,418,664
339 4,418,665
4,418,666
387 4,418,667
416 4,418,668
436 4,418,669
446 4,418,670
450 4,418,671
478 4,418,672
4,418,673
491 4,418,674
501 4,418,675
580 4,418,676
599 4,418,677

CLASS 126

9 R 4,418,678
201 4,418,679
289 4,418,680
343.5 A 4,418,682
343.5 R 4,418,681
400 4,418,683
419 4,418,684
428 4,418,685

CLASS 128

1 C 4,418,687
1 R 4,418,686
6 4,418,688
4,418,689
24 R 4,418,690
156 4,418,691
303 R 4,418,693
303.14 4,418,692
326 4,418,694
419 PG 4,418,695
476 4,418,696
640 4,418,697
641 Re.31,454
660 4,418,698
694 4,418,700
729 4,418,701
760 4,418,702
766 4,418,703
785 4,418,704

CLASS 131

84 R 4,418,705
296 4,418,706

CLASS 134

22.12 4,419,141

CLASS 135

24 4,418,707

CLASS 136

251 4,419,530
4,419,531
253 4,419,532
259 4,419,533

CLASS 137

15.2 4,418,708
115 4,418,709
117 4,418,710
269 4,418,711
312 4,418,712
351 4,418,713
478 4,418,714
508 4,418,715
605 4,418,716
614.2 4,418,717
615 4,418,718
625.31 4,418,719
625.65 4,418,720
810 4,418,721

CLASS 138

42 4,418,722
4,418,723
149 4,418,724

CLASS 139

59 4,418,725
383 A 4,418,726
448 4,418,727
452 4,418,728
4,418,729

CLASS 141

207 4,418,730

CLASS 144

194 4,418,731

CLASS 145

2 R 4,418,732

CLASS 148

1.5 4,419,142
3 4,419,143
6.2 4,419,144
11.5 F 4,419,145
12 F 4,419,152
23 4,419,146
31.5 4,419,147
120 4,419,148
131 4,419,149
187 4,419,150
400 4,419,151

CLASS 149

22 4,419,153
40 4,419,154
109.6 4,419,155

CLASS 152

158 4,418,734
200 4,418,735
354 R 4,418,736
416 4,418,737

CLASS 156

49 4,419,156
56 4,419,157
66 4,419,158
4,419,159
73.2 4,419,160
89 4,419,161
94 4,419,162
4,419,163
244.11 4,419,164
245 4,419,165
272.4 4,419,166
290 4,419,167
351 4,419,168
359 4,419,169
361 4,419,170
384 4,419,171
461 4,419,172
470 4,419,173
513 4,419,174
554 4,419,175
556 4,419,176
601 4,419,177
610 4,419,178
613 4,419,179
617 SP 4,419,180
640 4,419,181
644 4,419,182
666 4,419,183

CLASS 157

1.55 4,418,738

CLASS 160

120 4,418,739

CLASS 162

49 4,419,184

CLASS 164

287 4,418,740
454 4,418,741

CLASS 165

8 4,418,742
12 4,418,743
25 4,418,744

46 4,418,745
76 4,418,746
95 4,418,747
134 R 4,418,748
139 4,418,749

CLASS 166

214 4,418,750
261 4,418,751
267 4,418,752
273 4,418,753
278 4,418,754
281 4,418,755
383 4,418,756

CLASS 169

54 4,418,757

CLASS 172

7 4,418,758
197 4,418,759
271 4,418,760
4,418,761
311 4,418,762
776 4,418,763

CLASS 173

12 4,418,764
4,418,765
13 4,418,766
19 4,418,767
93.5 4,418,768
134 4,418,769

CLASS 174

10 4,419,534
48 4,419,535
52 R 4,419,536
65 R 4,419,537
117 F 4,419,538

CLASS 175

58 4,418,770

CLASS 177

1 4,418,771
4,418,772
16 4,418,773
210 FP 4,418,774

CLASS 178

18 4,419,539

CLASS 179

77 4,419,542
81 R 4,419,543
107 FD 4,419,544
111 E 4,419,545

CLASS 180

9.62 4,418,775
19 H 4,418,776
65 E 4,418,777
132 4,418,778
141 4,418,779
142 4,418,780
155 4,418,781
190 4,418,782
209 4,418,783
221 4,418,784
255 4,418,785

CLASS 181

116 4,418,786
130 4,418,787
224 4,418,788
255 4,418,789
268 4,418,790

CLASS 182

2 4,418,791
93 4,418,792
129 4,418,793

CLASS 187

17 4,418,794
29 R 4,418,795

CLASS 188

71.5 4,418,796
73.37 4,418,797
73.45 4,418,798
153 R 4,418,799
195 4,418,800
202 4,418,801
282 4,418,802
352 4,418,803

CLASS 190

18 A 4,418,804
111 4,418,806

CLASS 192

0.076 4,418,810
18 A 4,418,807
18 R 4,418,808
67 R 4,418,809
81 C 4,418,811
106.2 4,418,812

CLASS 193

35 J 4,418,813

CLASS 198

406 4,418,814
476 4,418,815
773 4,418,816
845 4,418,817

CLASS 200

11 G 4,419,546
19 R 4,419,547
38 R 4,419,548
50 A 4,419,549
80 R 4,419,550
144 AP 4,419,552
144 B 4,419,551
4,419,553
284 4,419,554
314 4,419,555
331 4,419,556

CLASS 201

4 4,419,185
6 4,419,186

CLASS 202

200 4,419,187

CLASS 203

24 4,419,188
77 4,419,189

CLASS 204

1 T 4,419,190
4,419,191
15 4,419,192
18.1 4,419,193
25 4,419,194
78 4,419,195
157.1 R 4,419,196
159.2 4,419,197
180 P 4,419,198
181 R 4,419,199
186 4,419,200
192 E 4,419,201
192 N 4,419,202
192 R 4,419,203
206 4,419,204
228 4,419,205
4,419,206
237 4,419,207
290 R 4,419,208
296 4,419,209
403 4,419,210
408 4,419,211
424 4,419,212
425 4,419,213

CLASS 206

196 4,418,818
216 4,418,819
279 4,418,805
334 4,418,820
370 4,418,821
441 4,418,822
538 4,418,823

CLASS 208

8 R 4,419,214
11 R 4,419,215
4,419,216
4,419,217
59 4,419,218
86 4,419,219
111 4,419,220
113 4,419,221
120 4,419,222
4,419,223
244 4,419,224
251 R 4,419,225
325 4,419,226
326 4,419,227

CLASS 209

9 4,419,228
534 4,418,824

CLASS 210

85 4,419,229
114 4,419,230
164 4,419,231
4,419,232
169 4,419,233
232 4,419,234
282 4,419,235
4,419,236
321.2 4,419,237
338 4,419,238
413 4,419,239
444 4,419,240
493.5 4,419,241
500.2 4,419,242
618 4,419,243
629 4,419,244
676 Re.31,456
681 4,419,245
721 4,419,246
726 4,419,247
764 4,419,248
783 4,419,249

CLASS 211

42 4,418,825

CLASS 215

231 4,418,826
247 4,418,827
252 4,418,828

CLASS 219

86.25 4,419,557
109 4,419,558
110 4,419,559
117.1 4,419,560
121 EB 4,419,561
130.01 4,419,562
137 R 4,419,563
206 4,419,564
222 4,419,565
230 4,419,566
336 4,419,567
441 4,419,568
522 4,419,570
528 4,419,569

CLASS 220

74 4,418,829
81 R 4,418,830
258 4,418,831
260 4,418,832
306 4,418,833
359 4,418,834
404 4,418,835

CLASS 221

37 4,418,836
222 4,418,837
246 4,418,838

CLASS 222

14 4,418,839
96 4,418,840
107 4,418,841
153 4,418,842
158 4,418,843
162 4,418,844
4,418,845
189 4,418,846
402.23 4,418,847
504 4,418,848

CLASS 223

78 4,418,849

CLASS 224

32 A 4,418,850
42.06 4,418,851
42.23 4,418,852
42.41 4,418,853
154 4,418,854

CLASS 225

96 4,418,855

CLASS 226

118 4,418,856

CLASS 228

124 4,418,857
159 4,418,858
183 4,418,859
196 4,418,860

CLASS 229

23 A 4,418,861
41 C 4,418,862
49 4,418,863
52 B 4,418,864
69 4,418,865

CLASS 235

1 C 4,419,571
69 4,419,572
383 4,419,573

CLASS 237

55 4,418,866

CLASS 239

88 4,418,867
228 4,418,868
317 4,418,869
533.8 4,418,870

CLASS 241

1 4,418,871
187 4,418,872
294 4,418,873

CLASS 242

DIG. 3 4,418,874
7.06 4,418,875
18 G 4,418,876
84.21 R 4,418,877
107.3 4,418,878

CLASS 244

53 B 4,418,879
199 4,418,880
224 4,418,881

CLASS 248

265 4,418,882
312.1 4,418,883

CLASS 249

11 4,418,884
100 4,418,885

CLASS 250

204 4,419,574
226 4,419,575
234 4,419,576
252.1 4,419,577
374 4,419,579
390 4,419,578
396 ML 4,419,581
396 R 4,419,580
424 4,419,582
458.1 4,419,583
492.2 4,419,584
505.1 4,419,585
551 4,419,586

CLASS 251

30 4,418,886
152 4,418,887
216 4,418,888
306 4,418,889

CLASS 252

8.6 4,419,250
32.7 E 4,419,251
4,419,252
34.7 4,419,253
37 4,419,254
51.5 A 4,419,255
62 4,419,256
62.54 4,419,257
89.1 4,419,258
142 4,419,259
174.13 4,419,260
182 4,419,261
299.61 4,419,262
299.63 4,419,263
4,419,264
331 4,419,265
392 4,419,266
500 4,419,277
501.1 4,419,278
514 4,419,279
522 R 4,419,280
4,419,281
4,419,282
600 4,419,283

CLASS 254

104 4,418,890
260 4,418,891

CLASS 260

123.7 4,419,288
158 4,419,289
186 4,419,290
245.2 R 4,419,284
349 4,419,285
4,419,286
397.1 4,419,287
410.7 4,419,291
410.9 R 4,419,292
453 A 4,419,294
453 AB 4,419,293
453 PH 4,419,295
464 4,419,296
465.2 4,419,297
501.16 4,419,298
929 4,419,299

CLASS 261

106 4,419,300
118 4,419,301
142 4,419,302

CLASS 264

9 4,419,303
25 4,419,304
36 4,419,305
40.5 4,419,306
46.5 4,419,307
49 4,419,308
53 4,419,309
59 4,419,310
60 4,419,311
82 4,419,312
130 4,419,314
145 4,419,315
167 4,419,313
184 4,419,316
4,419,317
274 4,419,318
292 4,419,319
296 4,419,320
328.12 4,419,321
343 4,419,322
523 4,419,323

CLASS 266

137 4,418,892
192 4,418,893
271 4,418,894

CLASS 267

36 R 4,418,896
63 R 4,418,898
140.1 4,418,895
4,418,897

CLASS 269

32 4,418,899
45 4,418,900
71 4,418,901
258 4,418,902

CLASS 271

10 4,418,903
37 4,418,904
98 4,418,905
99 4,418,906
157 4,418,907

CLASS 273

1 GE 4,418,908
33 4,418,909
55 B 4,418,910
85 G 4,418,911
138 R 4,418,912
150 4,418,913
153 S 4,418,914
159 4,418,915
207 4,418,916
313 4,418,917

CLASS 277

1 4,418,918
40 4,418,919
50 4,418,920
96.1 4,418,921
152 4,418,922
167.5 4,418,923
177 4,418,924

CLASS 279

50 4,418,925
62 4,418,926
4,418,927

CLASS 280

11.14 4,418,928
11.23 4,418,929
47.19 4,418,930
94 4,418,931
112 R 4,418,932
400 4,418,933
438 R 4,418,934
461 A 4,418,935
493 4,418,936
613 4,418,937
661 4,418,938
803 4,418,939
804 4,418,940

CLASS 282

27.5 4,418,941
4,418,942

CLASS 285

12 4,418,943
24 4,418,944
70 4,418,945
73 4,418,946
168 4,418,947
420 4,418,948

CLASS 290

44 4,419,587

CLASS 292

92 4,418,949
144 4,418,950
202 4,418,951
327 4,418,952

CLASS 294

67 A 4,418,953

CLASS 296

100 4,418,954
190 4,418,955
216 4,418,956

CLASS 297

85 4,418,957
457 4,418,958

CLASS 298

19 V 4,418,959

CLASS 299

5 4,418,960
4,418,961

CLASS 301

37 P 4,418,962

CLASS 303

3 4,418,963
6 C 4,418,964
22 R 4,418,965
100 4,418,966

CLASS 307

9 4,419,588
39 4,419,589
41 4,419,590
45 4,419,591
241 4,419,592
268 4,419,593
297 4,419,594
355 4,419,595
603 4,419,596

CLASS 310

68 D 4,419,597
311 4,419,598
4,419,599
361 4,419,600

CLASS 312

107 4,418,967
184 4,418,968
250 4,418,969
305 4,418,970

CLASS 313

131 A 4,419,601
332 4,419,602
346 R 4,419,603
385 4,419,604
485 4,419,605

CLASS 315

39.51 4,419,606
73 4,419,607
408 4,419,608

CLASS 318

7 4,419,609
12 4,419,610
443 4,419,611
571 4,419,612
632 4,419,613
653 4,419,614
811 4,419,615

CLASS 320

2 4,419,616

CLASS 322

2 R 4,419,617
7 4,419,618

CLASS 323

257 4,419,619
280 4,419,620

CLASS 324

51 4,419,621
57 Q 4,419,623
57 R 4,419,622
83 D 4,419,624
142 4,419,625
158 P 4,419,626

CLASS 328

4 4,419,627
67 4,419,628
72 4,419,629

CLASS 329

50 4,419,630

CLASS 330

255 4,419,631
277 4,419,632

CLASS 331

17 4,419,633
117 R 4,419,634

CLASS 333

116 4,419,635
131 4,419,636
147 4,419,637
211 B1 3,237,132
217 4,419,638

CLASS 334

7 4,419,639

CLASS 335

106 4,419,640
219 4,419,641
227 4,419,642
234 4,419,643
288 4,419,644

CLASS 336

65 4,419,645
90 4,419,646

92 4,419,647
215 4,419,648

CLASS 337

70 4,419,649
119 4,419,650
159 4,419,651

CLASS 338

28 4,419,652
47 Re.31,459
114 4,419,653

CLASS 339

14 R 4,418,972
17 L 4,418,971
31 L 4,418,973
75 M 4,418,974
91 R 4,418,975
4,418,976
99 R 4,418,977
4,418,978
113 L 4,418,979

CLASS 340

52 R 4,419,654
323 R 4,419,655
347 CC 4,419,656
347 R 4,419,657
521 4,419,658
552 4,419,659
653 4,419,660
707 4,419,661
750 4,419,662
783 4,419,663
784 4,419,664
825.06 4,419,665
4,419,666
4,419,667
825.44 4,419,668

CLASS 343

18 D 4,419,669
779 4,419,670
786 4,419,671

CLASS 346

33 M 4,419,672
75 4,419,673
4,419,674
108 4,419,675
4,419,676
140 R 4,419,677
4,419,678
155 4,419,679
163 4,419,680

CLASS 350

96.13 4,418,980
96.15 4,418,981
96.20 4,418,982
96.21 4,418,983
96.33 4,418,984
96.34 4,418,985
128 4,418,986
337 4,418,987
414 4,418,988
486 4,418,989

CLASS 351

41 4,418,990
161 4,418,991
169 4,418,992

CLASS 352

57 4,418,993
78 R 4,418,994
129 4,418,995

CLASS 353

33 4,418,996
111 4,418,997

CLASS 354

132 4,418,999
173.1 4,419,000
4,419,001
187 4,419,002
405 4,418,998

CLASS 355

3 FU 4,419,003
3 TR 4,419,004
4,419,005
14 R 4,419,006
14 SH 4,419,007
38 4,419,008
103 4,419,009
133 4,419,010

CLASS 356

1 4,419,011
141 4,419,012
400 4,419,013

CLASS 357

13 4,419,681
23 4,419,682
38 4,419,683
40 4,419,684
53 4,419,685

CLASS 358

13 4,419,686
4,419,687
27 4,419,688
37 4,419,689
75 4,419,690
4,419,691
113 4,419,692
140 Re.31,460
167 4,419,693
181 4,419,694
198 4,419,695
257 4,419,697
294 4,419,696
330 4,419,698
340 4,419,699

CLASS 360

77 4,419,700
4,419,701
96.4 4,419,702
97 4,419,703
102 4,419,704
103 4,419,705
105 4,419,706
106 4,419,707
132 4,419,708
133 4,419,709
4,419,710

CLASS 361

111 4,419,711
172 4,419,712
321 4,419,713
4,419,714
335 4,419,715

CLASS 362

96 4,419,716
148 4,419,717
205 4,419,718
218 4,419,719
285 4,419,720
368 4,419,721
396 4,419,722

CLASS 363

21 4,419,723

CLASS 364

200 4,419,724
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424 4,419,730
426 4,419,729
428 4,419,731
4,419,732
493 4,419,733
567 4,419,734
803 4,419,735
900 4,419,736
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4,419,739
4,419,740

CLASS 365

72 4,419,741
87 4,419,742
149 4,419,743
154 4,419,744
174 4,419,745
189 4,419,746
201 4,419,747

CLASS 366.

99 4,419,014
349 4,419,015

CLASS 367

31 4,419,748

CLASS 368

10 4,419,016
64 4,419,017
69 4,419,018
74 4,419,019

CLASS 369

11 4,419,749
111 4,419,750

CLASS 370

13 4,419,751
29 4,419,752
62 4,419,753
88 B1 3,597,549

CLASS 373

118 4,419,754
145 4,419,755

CLASS 374

12 4,419,020
101 4,419,021
125 4,419,022
179 4,419,023

CLASS 375

7 4,419,756
17 4,419,757
38 4,419,758
97 4,419,759
120 4,419,760

CLASS 377

16 4,419,761
66 4,419,762

CLASS 378

149 4,419,763
153 4,419,764

CLASS 381

1.05 4,418,599
7 4,419,541
51 4,419,540

CLASS 383

11 4,418,733

CLASS 400

120 4,419,024

CLASS 403

14 4,419,025
104 4,419,026
134 4,419,027
353 4,419,028
408 4,419,029

CLASS 405

278 4,419,030

CLASS 408

1 R 4,419,031
112 4,419,032

CLASS 410

32 4,419,033
83 4,419,034

CLASS 414

71 4,419,035
160 4,419,036
489 4,419,037
543 4,419,038
590 4,419,039
687 4,419,040
739 4,419,041
786 4,419,042

CLASS 415

7 4,419,043
117 4,419,044
119 4,419,045
127 4,419,046
150 4,419,047
196 4,419,048
206 4,419,049

CLASS 416

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140 4,419,051
214 A 4,419,052
234 4,419,053

CLASS 417

294 4,419,054
396 4,419,055
426 4,419,056

CLASS 418

36 4,419,057
133 4,419,058
150 4,419,059

CLASS 419

67 4,419,324

CLASS 420

464 4,419,325
584 4,419,129

CLASS 422

4 4,419,326
17 4,419,327
62 4,419,328
111 4,419,329
143 4,419,330
170 4,419,331
245 4,419,332

CLASS 423

235 4,419,333
240 4,419,334
290 4,419,335
345 4,419,336
574 R 4,419,337
658.5 4,419,338

CLASS 424

1.1 4,419,339
19 4,419,340
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54 4,419,342
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151 4,419,346
153 4,419,345
177 4,419,347
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195 4,419,349
225 4,419,350
245 4,419,351
248.4 4,419,352
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248.56 4,419,354
249 4,419,355
251 4,419,356
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253 4,419,358
256 4,419,359
258 4,419,360
273 R 4,419,361
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285 4,419,363
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321 4,419,366
330 4,419,367
331 4,419,368

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8 4,419,060
4,419,061
101 4,419,062
107 4,419,063
256 4,419,064
301 4,419,065
371 4,419,066
392 4,419,067
398 4,419,068

CLASS 426

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94 4,419,371
104 4,419,372
234 4,419,373
243 4,419,374
272 4,419,375
402 4,419,376
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434.5 4,419,394

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692 4,419,417

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194 4,419,422
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CLASS 431

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126 4,419,070
202 4,419,071
266 4,419,072
344 4,419,073
354 4,419,074

CLASS 432

217 4,419,075
253 4,419,076

CLASS 433

5 4,419,077
10 4,419,078

CLASS 434

43 4,419,079
172 4,419,080
188 4,419,081

CLASS 435

7 4,419,444
20 4,419,445
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161 4,419,448
170 4,419,449
253 4,419,450
298 4,419,451

CLASS 436

89 4,419,452
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42 4,419,082
56 4,419,083
58 4,419,084
93 4,419,085

CLASS 445

35 4,418,452

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36 4,419,765
62 4,419,766
164 4,419,767
180 4,419,768
182 4,419,769
301 4,419,770

CLASS 464

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439 4,419,087
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53 4,419,090

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540 4,419,500

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262 4,419,504
279 4,419,505
316 4,419,506

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302 4,419,507

CLASS 536

7.1 4,419,508
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84 4,419,510

CLASS 542

471 4,419,511

CLASS 544

70 4,419,512
222 4,419,513
334 4,419,514

CLASS 546

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119 4,419,516
144 4,419,517
279 4,419,518

CLASS 548

264 4,419,520
480 4,419,519

CLASS 549

404 4,419,521
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CLASS 560

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435 4,419,526
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CLASS 604

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93 4,419,094
96 4,419,095
132 4,419,096
174 4,419,097
263 4,419,098
275 4,419,099
339 4,419,100

D2—	253	271,629		172	271,645		339	271,661			271,677		70	271,692		86	271,709
		271,630		186	271,646		399	271,662		173	271,678		96	271,694		97	271,710
		271,631		201	271,647	D9—	307	271,663	D12—	131	271,679		106	271,695		136	271,711
		271,632		234	271,648		337	271,664		157	271,680	D15—	9.2	271,696		139	271,712
	310	271,633		253	271,649		370	271,665		183	271,681		147	271,697		151	271,713
D3—	40	271,634	D7—	6	271,650	D10—	6	271,666		317	271,682	D16—	38	271,698	D24—	27	271,714
D4—	04	271,635		29	271,651		65	271,667		326	271,683	D19—	26	271,699	D32—	15	271,715
D6—	63	271,636		39	271,652		78	271,668	D13—	11	271,684		33	271,700	D34—	14	271,716
	75	271,637			271,653		83	271,669		24	271,685	D21—	42	271,701		17	271,717
	113	271,638		47	271,654		106	271,670			271,686		87	271,702		24	271,718
	116	271,639		71	271,655			271,671		32	271,687		150	271,703		26	271,719
	137	271,640		104	271,656	D11—	5	271,672	D14—	11	271,688	D23—	23	271,704		37	271,720
	153	271,641		137	271,657		96	271,673		58	271,689		26	271,705		40	271,721
	162	271,642	D8—	14	271,658		131	271,674		60	271,690		32	271,706	D92—	1 P	271,722
	165	271,643		18	271,659		147	271,675			271,691		48	271,707	D99—	41	271,723
	167	271,644		71	271,660		158	271,676		63	271,693			271,708			

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DESIGN PATENTS

04	:	271,650			271,693	18	:	271,678			271,681			271,708	42	:	271,685
		271,655			271,697	20	:	271,673			271,720	36	:	271,657			271,686
06	:	271,629			271,712			271,701	27	:	271,651			271,700	45	:	271,642
		271,630			271,717			271,703			271,692			271,702			271,644
		271,631	08	:	271,719	21	:	271,664			271,695			271,704			271,646
		271,632	09	:	271,660	24	:	271,696	29	:	271,718	37	:	271,667	48	:	271,639
		271,636			271,714	25	:	271,671	32	:	271,647			271,684			271,675
		271,643	12	:	271,663			271,710	34	:	271,648			271,709			271,676
		271,666	13	:	271,634			271,713			271,661			271,711			271,677
		271,679			271,716			271,721			271,665	39	:	271,640			271,683
		271,680	17	:	271,635	26	:	271,649			271,691			271,674	51	:	271,659
		271,682			271,638			271,662			271,707	41	:	271,690	54	:	271,652
		271,687			271,641												

PLANT PATENTS

06	:	5,151		5,152		5,154	39	:	5,153		

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

34	:	T103,701	40	:	T103,702						

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